# EFFECTIVENESS OF PLANNED EDUCATIONAL PROGRAM ON THE KNOWLEDGE AND PRACTICE REGARDING CORONARY ANGIOGRAM CARE AMONG STAFF NURSES AT A SELECTED HOSPITAL IN CHENNAI

Dissertation submitted to

**THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY**

**CHENNAI**

In partial fulfilment of requirement for the degree of

**MASTER OF SCIENCE IN NURSING**

**OCTOBER 2015**

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## LIST OF ABBREVIATIONS

| | | |
|---|---|---|
| AHA | - | American Heart Association |
| ALS | - | Advance Life Support |
| BLS | - | Basic Life Support |
| CABG | - | Coronary Artery Bypass Graft |
| CAD | - | Coronary Artery Disease |
| CCF | - | Congestive Cardiac Failure |
| CHD | - | Chronic Heart Disease |
| CVD | - | Cardio Vascular Disease |
| IHD | - | Ischemic Heart Disease |
| INR | - | International Normalized Ratio |
| MI | - | Myocardial Infarction |
| NPO | - | Nil Per Oral |
| PCI | - | Percutaneous Coronary Intervention |
| PTCA | - | Percutaneous Trans luminal Coronary Angioplasty |
| RHD | - | Rheumatic Heart Disease |
| SD | - | Standard Deviation |
| STAI | - | Spiel Berger's State Anxiety Inventory |

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# *ABSTRACT*

# ABSTRACT

A study was conducted to assess the effectiveness of planned educational program on knowledge and practice regarding coronary angiogram care among staff nurses at a selected hospital in Chennai.

**The objectives of the study were:**

1. To assess the pre and post-test level of knowledge and practice of the staff nurses regarding coronary angiogram care.
2. To correlate the post-test knowledge and practice of the staff nurses regarding coronary angiogram care.
3. To assess the effectiveness of planned educational program on knowledge and practice of the staff nurses regarding coronary angiogram care.
4. To associate the mean differed level of knowledge and practice of the staff nurses with their selected demographic variables.

**Methodology**

The research approach was quantitative approach and the research design was pre-experimental one group pre-test and post-test. Sixty samples were selected based on sample selection criteria using non probability purposive sampling technique. The study was conducted in MMM hospital, Chennai. Structured questionnaire was used to assess the knowledge level and an observational check list to assess the practice level of staff nurses on coronary angiogram care. The data was collected in three phases.

**Findings**

The overall pre-test level of knowledge revealed that many 39(65%) needs improvement and 21(35%) had moderately adequate knowledge regarding coronary angiogram care. The overall post-test level of knowledge revealed that majority 59(98.33%) had adequate knowledge and 1(1.67%) had moderately adequate knowledge regarding coronary angiogram care.

The overall pre-test level of practice revealed that 30(50%) had fair practice and 30(50%) needed improvement and none of the samples had good practice regarding coronary angiogram care. The overall post-test level of practice revealed that all 60(100%) had good practice regarding coronary angiogram care.

The calculated 'r' test value r = 0.371 showed a moderate positive correlation between post-test knowledge and practice score which was found to be statistically significant at $p<0.01$.

The findings also revealed that the pre-test mean score of knowledge was 13.0 with S.D of 3.71 whereas in the post test the mean score of knowledge was 26.98 with S.D of 1.89. The calculated paired 't' test value t = 28.758 found to be statistically significant at $p<0.001$. The findings revealed that the pre-test mean score of practice was 22.63 with S.D of 2.01 whereas in the post- test the mean score of practice was 40.75 with S.D 1.51. The calculated paired 't' test value t = 57.933 was found to be statistically significant at $p<0.001$.

The findings revealed that there was statistical significance found between the mean differed level of knowledge and the demographic variable age ($\chi^2 = 4.286$) at ($p=0.038$)and there was no statistically significant association found with other demographic variables.

**Conclusion**

The study concluded that the planned educational program was effective in improving the knowledge and practice of staff nurses. It helps them to be more confident in their duty and to omit errors.

# *INTRODUCTION*

# CHAPTER – 1

## INTRODUCTION

"Knowledge is a treasure, but practice is the key to it"

— Lao Tzu

### 1.1 BACKGROUND OF THE STUDY

The heart is one of the most important organs in the entire human body. It is really nothing more than a pump, composed of muscle which pumps blood throughout the body, beating approximately 72 times per minute of our lives. The heart pumps the blood, which carries all the vital materials which help our bodies function and removes the waste products that we do not need. The walls of the heart are made up of three layers, while the cavity is divided into four parts. There are two upper chambers, called the right and left atria, and two lower chambers, called the right and left ventricles. The right atrium, as it is called, receives blood from the upper and lower body through the superior vena cava and the inferior vena cava, respectively, and from the heart muscle itself through the coronary sinus. Coronary arteries supply blood to the heart and the coronary veins removes the deoxygenated blood.

In the dynamic human life previously most of the deaths and diseases were mainly due to communicable diseases. Now the scenario has changed as non-communicable diseases such as diabetes, hypertension and Coronary Artery Disease (CAD) which has become the major burden in the society and also constitutes about 63% of all the deaths. CAD is also called "Ischemic Heart Disease" (IHD).

**World Health Organisation (WHO) (2009)** stated that around 23.6 million people will die because of Cardio Vascular Disease (CVD) by 2030 with high incidence in South East Asian countries. In 1990, there was an estimated 1.17 million deaths related from CAD and it was doubled to 2.03 million deaths in 2010. CAD was prevalent in India for last 40 years.

**According to the WHO report of 2009,** it has been concluded that the emergence of non-communicable diseases is responsible for 63% of all deaths

worldwide, which primarily includes CVDs, cancers, chronic respiratory disease and diabetes. Among this, cardiovascular disease brings a major part of disease burden to the society. CAD is the leading cause of deaths in United Kingdom (UK) and worldwide. It generally affects more men than women from the age of 50.

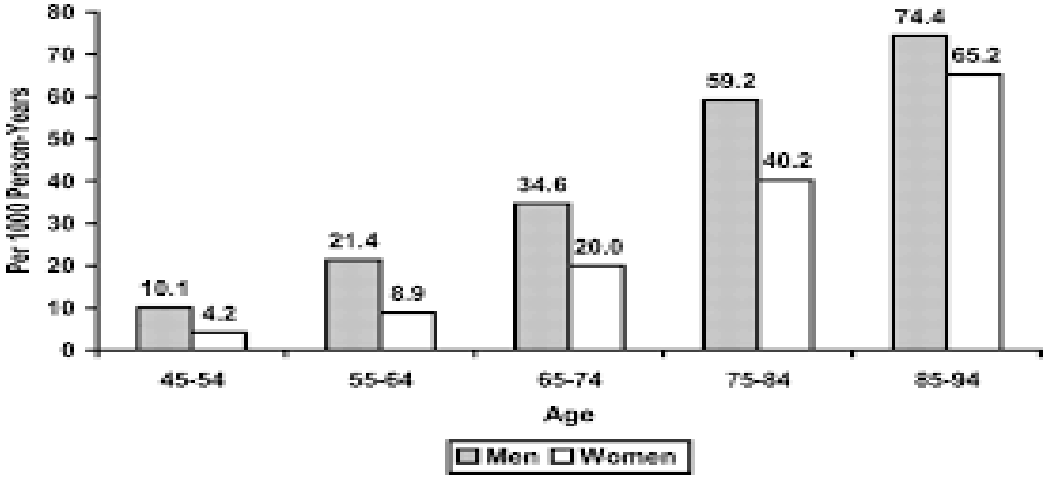


**Fig.1.1.1: Percentage of cardiac disease burden among men and women per thousand population**

**Source:** Heart Disease and Stroke Statistics—2009

**American Heart Association (AHA) (2007)** stated that, cardiovascular disease is the leading cause of mortality in United States. It is estimated that nearly 1.4 million deaths occur in every major ethnic group.

**British Heart Foundation (2007**) revealed that CAD accounted for more than 2, 33,000deaths in UK. Every 7 minutes a Canadian person dies out of CAD. **WHO (2001**) statistics states that nearly 91 people die every hour in the world due to heart attack with more incidence in younger group less than 40 years.

**According to WHO report 2010**, nearly 3.8 million men and 3.4 million women died worldwide due to CAD in the year 2008. Of the 57 million deaths occurred under the age of 70 globally in 2010 is mainly due to non-communicable disease out of which 82% is due to cardio vascular disease. In that 17 million deaths are due to CAD. The major cause of CAD is the formation of atherosclerotic plaque in the coronary artery there by blocking the blood supply to the heart. The risk factors include smoking,

tobacco, physical inactivity, unhealthy diet, blood pressure, diabetes etc. The surgical management includes Percutaneous Coronary Intervention (PCI) and Coronary Artery Bypass Graft (CABG). Angioplasty opens blocked or narrowed coronary arteries with a balloon tipped catheter and this widens the artery and restores the blood flow and in CABG, arteries or veins from other areas of the body are used to bypass the narrowed arteries.

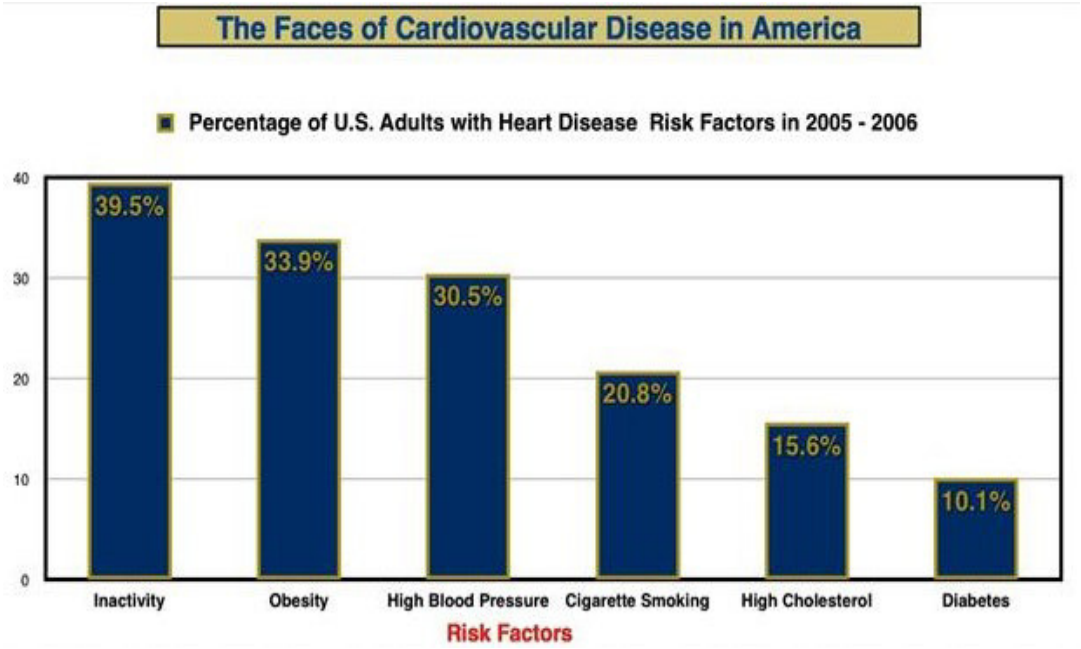


**Fig.1.1.2: Percentage of risk factors in adult with cardiac disease in U.S (2005-2006)**

**Source:** Heart Disease Risk Factor Statistics 2006

The proportions of cardiovascular deaths caused by IHD, cerebrovascular disease, inflammatory heart disease, Rheumatic Heart Disease (RHD), hypertensive heart disease, and other cardiovascular diseases among men and women in 2011 is depicted below. Globally CVDs are comprised principally of Chronic Heart Disease(CHD) (including stable and unstable angina, nonfatal Myocardial Infarction(MI), and coronary death), heart failure, cardiac arrest, ventricular arrhythmias and sudden cardiac death, RHD, transient ischemic attack, ischemic stroke, subarachnoid and intracerebral haemorrhage, abdominal aortic aneurysm, peripheral artery disease, and congenital heart disease. Ischemic heart disease, which consists principally of CHD, is the predominant manifestation of CVD, and causes 46% of cardiovascular deaths in men and 38% in

women. Cerebrovascular disease is the form of CVD with the second-highest mortality- 34% of cardiovascular deaths in men and 37% in women.

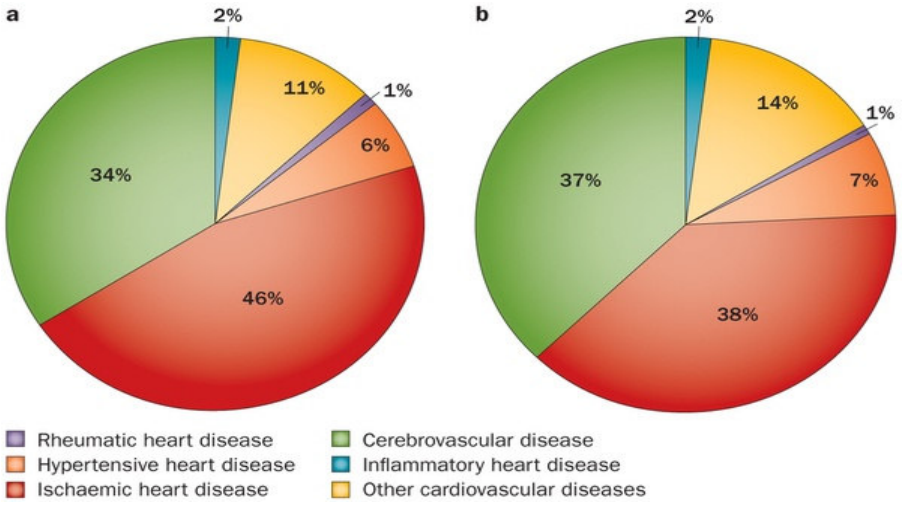


**Fig.1.1.3: Percentage of total non- communicable disease among men and women in 2010**

**Source:** Global Status report on non- communicable diseases. Geneva: WHO 2010.

In national wide 45 million people are affected with CAD with an increasing number of young Indians getting effected. In India, in the past 5 decade the rate of CAD among urban population has risen from 4% to 11%. An estimated 1.5 million people die due to CAD every year. The prevalence of CAD was higher in Kerala (4.6%) than in Tamil Nadu (4.3%) or Gujarat (3.5%). The prevalence was higher in South India especially in lower socioeconomic groups. The main risk factors of coronary artery disease include lack of exercise, poor diet, smoking, exposure to chemicals and other environmental exposures.

As a solution to identify CAD, PCI is probably the greater technological innovation provided in the field of cardiology. Coronary angioplasty is a revascularization procedure that has revolutionized the treatment of IHD over the past 20 years. Coronary angiogram is now a gold standard in diagnosing CAD. In India, approximately one lakh coronary angiograms are performed each year. The purpose of coronary angiography is to visualize the coronary anatomy and the degree of obstruction

of the coronary arteries. According to the reports the rate of coronary angiogram is increasing day by day.

Coronary angiography is very safe and is performed to detect an occlusion in the coronary arteries of the heart, by inserting a catheter into the coronary artery, either using a femoral or radial approach in order to view the patency of blood flow through the heart. Its risk and complication are very rare and the knowledge will help the staff nurses to detect them early and offer great assistance in preventing complications **(Patient Education Institute, 2005)**.

The number of people opting for coronary angiography is increasing tremendously in UK, USA, India and in many other nations. It has been calculated that more than 1 million coronary angiograms are performed every year worldwide. The studies showed that more than 5.5 lakh coronary angiogram is performed in USA each year **(The American Academy of Cardiac Surgeons, 2005)**.

According to the **Cardiac diagnostic conference (2007)**, the number of coronary angiography patients has increased dramatically. According to them India's total patients were 1,02,87,37,436 which showed a 21.3% increase since 1991, among them 7, 66, 22,381 were coronary angiography patients.

According to **World medical Diagnostic procedure (2010)**, the percentage of patients undergoing coronary angiogram diagnostic procedure in various countries was represented as India 68.6, Russia 65.9, Saudi Arabia 75.9, United Kingdom 78.8, Australia 80.6, South Africa 42.5 and United States of America 78.

In Indian hospitals more than 76.6 million people are admitted per year after coronary angiography. With regard to the data of health ministry, India has 76,622,321 patients admitted per year in which 11.6 million are from Uttar Pradesh, 8.45 million from Maharashtra and 5.5 million from Tamil Nadu.

The angioplasty is a less invasive alternative to bypass surgery because the procedure is performed through a small puncture site in the skin in contrast to insertion in the chest required for bypass. The hospital stay can also be minimised with the

emergence of angioplasty. Compared to CABG, the pain is also very less. But the treatment decisions are made on a case by case basis.

Coronary angioplasty is a revascularization procedure that has revolutionized the treatment of IHD over the past 20 years. Coronary angiogram is now a gold standard in diagnosing CAD. A study conducted by national interventional council on the Indian coronary data for the year 2011 was published in Indian heart journal September 2013 which states that "A total of 152332 PCI procedures were performed in 332 centres and there is a growth of 28.8% as compared to the data available for the previous year". In India, approximately 1 lakh angiograms are performed each year. In US in the year 1993, the coronary angiogram was performed on 10 lakhs patient's which has increased to 30 lakhs by the year 2010. The risk of major complication is less than 2% but the factors such as patient's conditions, acute renal insufficiency and cardiomyopathy significantly increases the risk.

Complication rates of PCI are low but neither negligible nor irreducible. Complication ranges widely from minor problems with short term sequel to life threatening situations that may cause irreversible damage, if urgent care is not provided. The complication of coronary angiogram includes hematoma formation, pseudo aneurysm, neuropathy, bacteraemia etc. The extent of CAD, Congestive Cardiac Failure (CCF), MI and bleeding are few of cardiovascular characteristics that can increase the complications.

## 1.2 SIGNIFICANCE OF THE STUDY

**The WHO report (2008)** emphasised on the fact that CAD is a modern epidemic and CAD will be India's number one killer by 2010. The major cause of mortality and disease in Indian subcontinent is CAD causing more than 25% of deaths.

**Guptha (2010)** stated that it has been predicted that the disease will increase rapidly in India and our country will be the host to more than half the cases of heart disease in the world within the next 15 years.

**Dr.Ansari (2005)** stated that the prevalence of CAD by 2010, 60% of heart disease patient will be Indians.

**Usman (2008)** reported that CAD is the most common cause of death in UK. One in five men and one in seven woman die due to coronary heart disease. About 94000 deaths occurred from CAD in UK every year and the most vulnerable group belongs to more than 55 years of age and over.

**Mckinsey (2005)** stated that annual statistics revealed that nearly 174 million angiogram diagnostic procedures are performed each year with a rate of 1 for every 60 people in the world. Majority of the patients got well and went back home without any complications. The complication rate varies from 3% to 16% and permanent disability rate ranges from 0.4% to 0.8%.

**Simon (2002)** projected the metaanalysis of epidemiological studies of India, revealed that 2.6 lakhs patients got admitted in hospitals for coronary angiogram every year and nearly 35% to 39% were affected by complications after the procedure, sometimes end up with deleterious effect to the patients.

**Balduf (2010)** stated that 224 procedures were performed by 3 board certified vascular surgeons over a period from May 1999 to August 2000 out of which 144 were diagnostic angiography and they compared the complications of initial 25 and subsequent 119 angiography to evaluate the learning curve. The study findings revealed that 38% of angiography was done to define aneurysmal anatomy, 51% to rule out peripheral arterial stenosis and 12% to identify carotid artery disease. The complication rates involved in these three types were 0%, 2.7% and 5.9% respectively.

**Taylor (2001)** states that after coronary angiography the post-operative patients were mostly affected by back pain sleep disturbance and discomfort. Sleep management measure, psychological support, comfortable position and calm environment should be involved in the nursing care to improve the comfort level of the patients.

**Moris (2001)** states that coronary angiography can result in slow or increased arterial function resulting in pain, bleeding, dysrhythmia and an increased risk of back pain. Changing patient's position during the post procedural period has a great impact in reducing back pain.

**Advanced clinical care (1990)** published an article on cardiac catheterization - before and after, what the patient need to know, what the nurses need to know. This provided helpful information for nurses regarding preparing patient for procedure, pre-catheterization and post-catheterization teaching information, discharge instructions and follow up care.

**Monett & Roberts (1995)** published an article in describes the current management of patients posted for interventional cardiac catheterization and also given information about the new catheters, monitoring equipment and standards for the skilled personal.

**Tracey (2009)** published an article on evidence based care for patients undergoing coronary angiogram, which aim at updating the nurse's knowledge and skill on caring for a patient undergoing coronary angiogram. The indication, contraindication and complication, various aspects of patient care were also discussed.

**Thomas & Longo (1976)** published an article on care of patients after cardiac catheterization. The article emphasises that the nursing action is very important to recognize and interpret potential post-catheterization complications. Any invasive procedure can lead to complications, quick and accurate nursing assessment and action are essential. They have enlisted the possible complications of cardiac catheterization which the nurses may encounter. This is divided into possible causes and their plan of action.

**Roberts (1989)** published an article on caring for patients undergoing therapeutic cardiac catheterization. In this he explained the role of critical care nurses in cardiac catheterization procedure and he emphasised that with courage and skill the risk of interventional catheterization can be minimized.

**De Vito Dabbs et al (1999)** published an article on "Nursing assessment of patient readiness for ambulation after cardiac catheterization". The article explains that nurses perform routine activities to prevent vascular complications, but determining patient's readiness for ambulation has received minimal research attention. More emphasises should be given in educating nurses to determine patient readiness for

ambulation and to make them realize that it is safe and effective way to promote patients comfort.

The frequently observed post-procedural complications includes hematoma formation, acute vessel perforation and the patient will have the chance to develop contrast hypersensitivity, vasovagal reaction, pseudo aneurysm, retro peritoneal haemorrhage, infection, arteriovenous fistula. So the nurses should be vigilant enough to rule out the complications to avoid serious mishaps.

The complication rates of coronary angiogram cannot be neglected. Here arises the need for a checklist which was suggested by many researchers while working in the coronary care unit. A check list is an effective method to improve best practices and is a simple cost effective method to prevent or omit errors. Implementation of a checklist for pre and post angiogram period will improve their assessment, quality of care and can help to prevent errors. Nurses play a major role in providing care to patients in all the phases of coronary angiogram including pre intra and post period. The enhancement of knowledge regarding coronary angiogram care is essential in preventing complications. Nurses are the first hand members who are around the clock with the patients and should have sufficient knowledge and practical skill in caring the patient and identifying complications as early as possible to prevent life threatening situations for the patients. Nurses responsibility includes continuous cardiac monitoring assess the quality of the pulse, record vital signs, observe for any bleeding or hematoma, check for numbness or cold and clammy extremities, pain management thereby preventing complications.

When the nurse researcher was posted in MMM hospital she identified that there were more than two hundred cardiac patients is attending the outpatient department in a daily basis out of which nearly 80% of the patients were diagnosed with CAD. It was understood that there were nearly 5-8 patients were posted for CABG every day and nearly 10-15 coronary angiograms were performed in the catheterization lab on a daily basis where the study was conducted. As a cardiothoracic speciality nurse, the nurse researcher felt the need for enriching the staff nurses with recent updates of coronary angiogram by conducting a planned educational program. The literature review also highlighted the magnitude of the complications of improper coronary angiogram care by the health personnel and also the nurse investigator felt the need by her own observation

in the clinical area. This led the nurse researcher to select the area of coronary angiogram for the present study.

## 1.3 STATEMENT OF THE PROBLEM

A pre-experimental study to assess the effectiveness of planned educational program on the knowledge and practice regarding coronary angiogram care among staff nurses at a selected hospital in Chennai.

## 1.4 OBJECTIVES OF THE STUDY

1. To assess the pre and post-test level of knowledge and practice of the staff nurses regarding coronary angiogram care.
2. To correlate the post-test knowledge and practice of the staff nurses regarding coronary angiogram care.
3. To assess the effectiveness of planned educational program on knowledge and practice of the staff nurses regarding coronary angiogram care.
4. To associate the mean differed level of knowledge and practice of the staff nurses with their selected demographic variables.

## 1.5 OPERATIONAL DEFINITION

### 1.5.1 Effectiveness

Refers to the degree to which the objectives are achieved in enhancing the cognitive and conative skills of staff nurses regarding coronary angiogram care.

### 1.5.2 Planned educational program

Refers to systematically planned and developed teaching module designed for staff nurses, which included general aspects of coronary angiogram, indications, contraindications, pre and post coronary angiogram care, complications using power point presentation.

### 1.5.3 Knowledge

Refers to the awareness and understanding of staff nurses regarding the various aspects of coronary angiogram care which was measured with the help of structured self-administered questionnaire.

### 1.5.4 Practice

Refers to procedural steps followed by staff nurses during pre and post coronary angiogram care which was assessed with the help of an observational checklist.

### 1.5.5 Coronary angiogram care

Refers to the care given by the staff nurses during pre and post coronary angiogram phases, provided for the safety and best quality care of the patient.

### 1.5.6 Staff Nurse

Refers to qualified and registered staff nurses working in cardiac unit of MMM hospital, Chennai.

## 1.6 HYPOTHESES

**$NH_1$:** There is no significant relationship between the post-test knowledge and practice of staff nurses regarding coronary angiogram care.

**$NH_2$:** There is no significant difference in pre and post-test level of knowledge and practice of staff nurses regarding coronary angiogram care.

**$NH_3$:** There is no significant association of mean differed level of knowledge and practice of the staff nurses with their selected demographic variables.

## 1.7 ASSUMPTION

1. The patient undergoing coronary angiogram is prone to develop complications.
2. Staff nurses need adequate information on coronary angiogram care.
3. Planned educational program enriches the knowledge of staff nurses and which help them to practice better coronary angiogram care.
4. Protocol guides the nurses to perform standard care and helps to omit errors.

## 1.8 DELIMITATION

1. Study is delimited to a period of four weeks of data collection.
2. Study is delimited with the staff nurses in MMM hospital.

## 1.9 CONCEPTUAL FRAMEWORK

The conceptual framework designed for this study is based on Imogene King's "Goal attainment theory". In 1981 she refined her ideas in A Theory for Nursing: systems, concept and process. King proposes an open system framework as a theory for goal attainment. Her vision of the nursing process had a strong emphasis on interpersonal process. King bases her theory on general system theory, the behavioural sciences, deductive and inductive reasoning.

### 1.9.1 GENERAL CONCEPTS OF IMOGENE KING'S GOAL ATTAINMENT THEORY

The open system framework consists of three interacting system: personal, interpersonal and social system on the assumption that humans are open system in constant interaction with their environment.

**Personal system**:

This system is based on the individual and includes perception, self, growth and development, body image, space and time.

i) Perception – It refers to a person's representation or reality and it is universal, subjective and unique to each person.

ii) Self – Refers to a person's subjective environment that makes up the person. It included ideas, attitudes, values and commitments.

iii) Growth and Development – Refers to all the changes occurring in a person.

iv) Body image – Refers to the manner in which one perceives one's body and the reaction of others to it.

v) Space – Refers to the immediate physical territory occupied by a person and to the person's behaviour.

vi) Time – Refers to a sequence of event and the relationship to each other.

**Interpersonal system**:

This system occurs when humans socialize and includes interaction, communication and transaction, role, stress, coping. The greater the number of interacting individuals, the more complex will be the interaction. Two interacting systems form a dyad, three forms a triad and four or more form a small or large group.

i) Interaction – Refers to verbal and non-verbal behaviour between an individual and the environment or between two or more individuals which will be goal directed.

ii) Communication – Refers to the transmission of information from one person to another either directly or indirectly and it is the information component of the interaction.

iii) Transaction – Refers to the interaction between the person and the environment for the purpose of goal attainment.

iv) Role – Refers to the expected behaviour of a person in a specific position.

v) Stress – Refers to an exchange of energy either positive or negative between a person and environment.

**Social Systems**:

When interpersonal systems come together, they form larger system called social systems. A social system comprises of social roles behaviours and practices developed to maintain values and include organisation, authority, power, status and decision making.

i) Organisation – Refer to a group of people with similar interest to achieve personal and organisational goals.

ii) Authority – Refers to the observable behaviour of providing guidance, order and being responsible for actions.

iii) Power – Is a means by which one or more person can influence others.

iv) Status – Refers to the position occupied by a person in a group or in an organisation.

v) Decision making – Results from developing and acting on perceived choices of goal attainment.

### 1.9.2 APPLICATION OF MODIFIED IMOGENE KING'S GOAL ATTAINMENT THEORY FOR THE PRESENT STUDY

The conceptual system composed of three interacting system; the personal system, the interpersonal system, and social system.

**Personal system**

Each personal system represents an individual. When individuals interact with each other it forms an interpersonal system or interacting system. Nurse researcher has her own perception, values, beliefs and judgement and she experience each system in a unique manner. Each staff nurse is a personal system having their own perception, values, and judgement and they come together for a purpose and makes judgment.

**Interpersonal system**

The members of the interpersonal system interact with each other by means of verbal and non-verbal behaviour and transmit information from one person to another either directly or indirectly for a purpose of goal attainment. Each one is expected to perform goal specific action to their position. Here the nurse researcher and the staff nurse interact with each other for transmitting the information.

**Perception and judgement**

During the process of interaction the nurse researcher by means of pre-test and assessment perceives that nurses working in cardiac unit need to be updated with the knowledge regarding coronary angiogram care and decides that planned educational programme can only update the knowledge of staff nurses. The staff nurse working in cardiac unit also perceives the reality of need for updating of knowledge and skill on coronary angiogram care and decides that continuous learning can only help them to update the current trends in coronary angiogram.

**Action and reaction**

Action is the mental and physical preparation of the individual to bring out desirable changes in the behaviour. A nurse researcher mentally prepares to educate the nurses and prepare material for planned educational programme. Staff nurses prepare mentally to show their consent and readiness for learning the information.

**Interaction**

Interaction is characterised by values, mechanisms being influenced by perceptions which contains the verbal and non-verbal communication. It is the observable behaviour of two or more persons in mutual presence. Here the researcher

and nurse mutually set goal in gaining adequate knowledge and practice regarding coronary angiogram.

**Transaction and communication**

It is the exchange of information between two systems to attain goal. It represents the human interaction and communication and the exchange of information between people during face to face meeting. Here the researcher conducts the planned education on coronary angiogram care using power point presentation to a group of nurses working in cardiac unit.

**Goal oriented behaviour**

The goal of interaction between the staff nurse and nurse researcher is achievement of knowledge and skill on coronary angiogram. Here the nurse researcher assesses goal attainment by means of post-test. If adequate knowledge is achieved the nurse researcher plans for enhancement by periodical educational program. If inadequate knowledge is achieved the nurse researcher reassess by means of interaction and identifies the need by perception and decides the plan of action to achieve the desired goal.

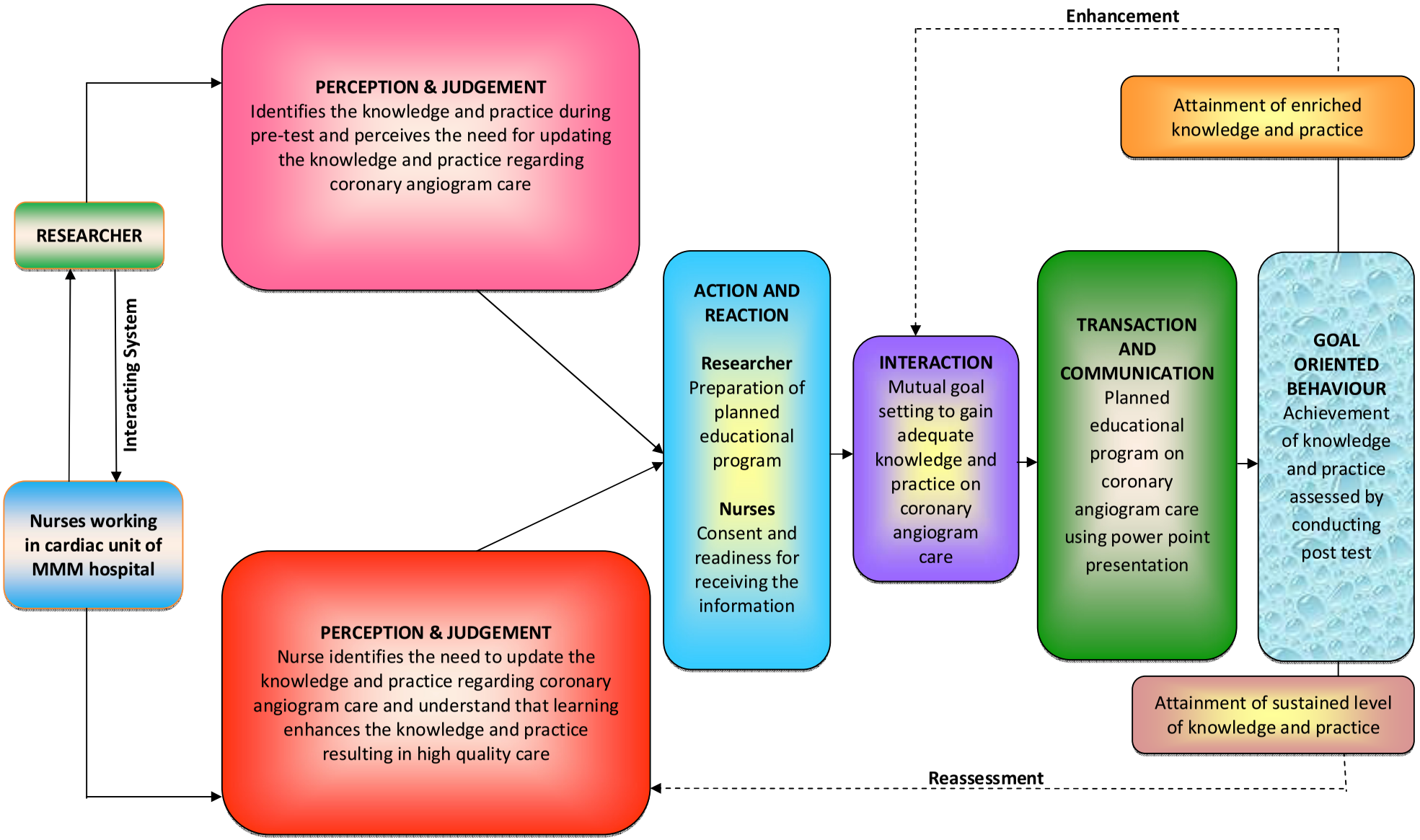


**Fig.1.9.1: Conceptual framework based on modified Imogene king's goal attainment model (1981)**

# *REVIEW OF LITERATURE*

# CHAPTER – 2

## REVIEW OF LITERATURE

Researchers rarely conduct research in an intellectual vacuum. Their studies are undertaken within the context of an existing base of knowledge. Review of literature is a broad, comprehensive, in-depth, systematic and critical review of scholarly literature, unpublished scholarly print materials, audio visual materials and personal communications on a particular topic.

Review of literature helps to lay the context and foundation for a new study. The process of review begins even before the selection of the topic and continues till the publication of the report. The researcher carried out in-depth review of literature relevant to the topic to gain knowledge and collect information for paving the foundation for his/her research.

The review of the literature is presented in two parts.

**2.1: General concepts of coronary angiogram care**
**2.2: Research review**
**2.2.1 Section A: Literature related to knowledge on coronary angiogram care**
**2.2.2 Section B: Literature related to practice regarding coronary angiogram care**
**2.2.3 Section C: Literature related to complications related to coronary angiogram care**

### 2.1: General concepts of coronary angiogram care

**Introduction**

Percutaneous coronary intervention is probably the greater technological innovation in the field of cardiology. It is the gold standard procedure in diagnosing coronary artery disease. “Caude Bernard” was the first person to perform in 1844 and he was responsible for naming it as “cardiac catheterization”.

**Meaning:**

Coronary angiography is a procedure that uses a special dye (contrast material) and X-rays to see how blood flows through the coronary arteries of the heart. Coronary angiography is commonly performed by the percutaneous femoral approach using polyurethane catheters. The catheters are guided over a guide wire through distal aortic arch to coronary ostieum. The guide wire is withdrawn and the catheter will be filled with contrast medium and images are recorded to ensure that all coronary segments are seen. It is the technique used to enlarge the internal diameter of the diseased vessel by applying balloon pressure to an area of stenosis. When inserted through radial or femoral artery it reaches the aortic root and images are recorded

**Indications:**

Coronary angiography is done for patients who are having CAD. It is a diagnostic procedure to rule out CAD. The indication for coronary angiography includes suspected coronary artery disease or known coronary artery disease with stable patterns, acute coronary syndrome, unstable angina, Non ST elevated myocardial infarction and ST elevated myocardial infarction with unstable pattern, congestive cardiac failure, preoperative assessment for non-cardiac surgery and structural or valvular heart disease.

**Contraindication:**

The contra indications of coronary angiogram include:

1. Coagulopathy.
2. Renal failure.
3. Anemia.
4. Contrast allergy.
5. Active infection.
6. If patient is not willing.

.

**Pre procedural care:**

1. Medical and surgical history should be collected.
2. Information about the history of allergy to iodine should be obtained.
3. History regarding smoking and alcohol should be obtained.
4. Assess the patient ability to do activities of daily living.
5. Check all previous documents are available.

6. Maintain good rapport with the patient.
7. Clarify all doubt and reassure the patient.
8. Record vital signs half an hour before going to catheterization lab.
9. Check quality of pulse in the extremities and record.
10. Monitor weight and height and record.
11. Before shifting ensure that patient empties bladder.
12. Therapeutic touch should be provided to reduce the anxiety level of the patient.
13. Keep patient in nil per oral status for 4-6hours.
14. Intake output chart should be maintained.
15. Anticoagulants should be withdrawn prior to the procedure.
16. Allen's test should be performed to assess the patency of ulnar artery.
17. Patient should be off heparin 6hours before coronary angiogram.
18. Check all reports are collected or not.
19. Skin preparation to be done in a sterile manner.
20. Accessory and ornaments should be removed.
21. Teach the importance of taking deep breath and hold it without bearing down just before the injection, because it clears the diaphragm from the field.
22. Teach the patient to cough during angiogram to reduce flushing sensation.
23. Patient should be given instruction to skip anti-diabetes medication on the day of procedure to prevent hypoglycemia.
24. Explain to patient and relatives that the procedure may last for 30 – 60 minutes.

**Post procedural care:**

1. Assess & records vital signs every 15 minutes for 1st hour, every 30minutes for next 2 hours, every 1 hour for 4 hours.
2. Check for any numbness of the extremity.
3. Assess the intensity of pain using pain scale.
4. Administer IV fluids as the contrast agent is an osmotic diuretic.
5. Maintain intake output chart.
6. Start with soft diet as per doctor's order.
7. Elevate the head end to 30 degree angle.
8. Lie down flat & apply pressure firmly with the finger tips using a clean cloth.
9. Instruct the patient that they should not lift any object more than 10 kg for 72 hours.

10. After 24 hours remove the wound site dressing & shower.
11. Instruct the patient do not drive any vehicle or operate any machine for 24 hours, if stent is placed wait for 48 hours.
12. Resume with a heart healthy diet.
13. Follow up care should be done according to doctor's order.

**Complication:**

The complications of coronary angiography can be classified into major and minor complications.

The major complications include:

- ✓ Myocardial infarction.
- ✓ Major embolization.
- ✓ Death.

The minor complications include:

- Puncture site complications
    a. Hematoma:- Hardened area in the site with pain & discoloration.
    b. Acute vessel perforation.
- Contrast hypersensitivity
    a. Cutaneous and mucosal:- Utricaria, pruritus, angioedema, laryngeal edema.
    b. Smooth muscle:- Bronchospasm causes dyspnea, cough and chocking sensation.
    c. Cardiovascular:- Hypotension, arrhythmia.
- Vasovagal reaction:- Hypotension, nausea, yawning, vomiting, diaphoresis.
- Pseudo aneurysm:- Painful pulsatile mass, new bruit, groin pain or burning.
- Retroperitoneal hemorrhage:- Hypotension, flank pain.
- Infection:- Pain, erythema, fever, purulent discharge.
- Arteriovenous fistula:- Palpable thrill, audible bruit.

## 2.2: Research review

### 2.2.1 Section A: Literature related to knowledge on coronary angiogram care

**WU et al (2014)** evaluated the effectiveness of an accessibility enhanced multimedia informational educational program, in reducing the anxiety level of patients undergoing cardiac catheterization. The aim of the study was to assess the effectiveness of the educational program in reducing anxiety and increasing satisfaction with the information. The study design used was a randomised experimental design with three cohort prospective comparison. The sample size was 123 patients and they were randomly assigned to three groups one with regular education, one with accessibility enhanced multimedia informational education and one with digital video education. Using Spielberger's anxiety inventory, the anxiety of the patients was assessed before education immediately after the education, before cardiac catheterization and one day after cardiac catheterization. The study findings revealed that the patients who received accessibility enhanced multimedia informational education had lower anxiety at ($p=0.004$) and they concluded that the accessibility enhanced multimedia informational education was the most effective educational module for patients undergoing cardiac catheterization.

**Mahgoub et al (2013)** assessed the impact of knowledge about early ambulation on patient's satisfaction on post percutaneous interventions. The study was conducted in Assuit university hospital. The aim of the study was to assess the knowledge of patients about early ambulation during post intervention period. The design used was a quasi-experimental design consisting of an experimental and control group with a sample size of 40 patients' in each by conducting pre and post- test. The tool has got 4 parts including assessment of patient after femoral sheath removal, pre and post- test knowledge sheet, pre and post observation checklist, and satisfaction assessment sheet. Knowledge was assessed by the sheet filled by the patient and satisfaction with checklist The study findings revealed that there is a significant improvement in all the parameters ($p<0.001$) and they concluded that teaching the patient's before the procedure can improve their level of knowledge and satisfaction.

**Paganin & Rabelo (2012)** done a clinical validation study of impaired physical mobility of patients admitted for cardiac catheterization. The aim of the study was to validate the defining characteristics of nursing diagnosis related to impaired physical

mobility. The study design adopted was cross sectional study with a sample size of 250. They validated 3 of the 11 NANDA defining characteristics, such as limited range of motion, limited ability to perform, gross motor skill and difficulty turning. The study findings revealed that there was a statistically significant agreement with the inter-rater method to its relevance and was assessed using kappa coefficient.

**Chair et al (2012)** assessed the effect of video tape educational intervention on patients undergoing cardiac catheterization. The study design was quasi-experimental study, with a sample size of 132 patients undergoing cardiac catheterization. The anxiety level of the patients was assessed before the intervention using the Chinese state anxiety inventory and 20 to 24 hours after cardiac catheterization. The study findings revealed that, the use of video tape was effective in reducing the anxiety level of patients undergoing cardiac catheterization at ($p<0.001$) and they concluded that videotape education can be suggested for patients undergoing cardiac catheterization.

**Sangka Chand et al (2011)** had done a study on continuous ST segment monitoring, nurses' attitude, practice and quality of patients care. The aim of the study was to assess the nurse's knowledge in monitoring ischemia. The study was done with 61 staff nurses and their base line data of practice and attitude towards ischemia were monitored. Later an education was provided with ST-map software and follow-up data were collected after 4 months. The study findings revealed that, there was a significant improvement in knowledge from 13% to 90% before and after ST-map at ($p<0.001$).

**Passali et al (2011)** evaluated the nurses and doctors knowledge on "basic and advanced life support resuscitation guidelines". The aim of the study was to assess and compare the theoretical knowledge of staff nurses and doctors on basic life support (BLS) and advanced life support (ALS). 84 nurses and 134 doctors were selected for the study and they were asked to answer a questionnaire consisting of demographic variables, resuscitation experience questions and 15 knowledge questions. Post-test was conducted after the resuscitation training program. The study findings revealed that training program had a positive effect on the knowledge and also found that nurses and doctors working in high risk areas of cardiac unit and those who have more experience in cardiac area scored significantly more. They concluded that ALS training should be included in the nursing curriculum.

**Stacy (2011)** had conducted a study to create a self-learning module for nurse those who care for patients undergoing angioplasty and receiving anticoagulation therapy. The aim of the study was to formulate a self-learning module for the nurses. The design adopted for the study was pre experimental one group pre-test and post-test design with a sample size of 24. Pre-test was done followed by self-learning module was introduced to the staff nurses and then evaluated the post-test knowledge. The study findings revealed that self-learning module enhanced the knowledge of the staff nurses and improved patient's safety.

**Arathy (2011**) had done a study to assess the knowledge and practices among cardiac nurses about patient's safety after cardiac catheterization .The study was done by conducting a survey with a sample size of 30 using a questionnaire and an observational tool. The study findings revealed that the knowledge level is more in staff nurses who have more than five years of experience (p=0.015)

**King et al (2010)** conducted a model for a nurse led program of bed side placement of peripherally inserted central catheters in neonates and infants with congenital heart disease. They evaluated the nurse performance during central catheter insertion for success, complication and completion of therapy after giving an educational program. About 125 central catheters were inserted in 105 patients successfully with complications limited to 3 people and the nursing team respond to 90% of the request within 24 hours. The finds revealed that the educational program was effective.

**John et al (2008)** assessed the nursing care of patients undergoing percutaneous coronary intervention (PCI) using a patient journey approach. The aim of the study was to evaluate the current literature regarding the nursing care given for patients undergoing PCI. The design adopted for the study was systematic review and data collected from the electronic data basis including CINAHL, MEDLINE, Cochrane and Joanna Briggs. The study revealed that the frequency of procedure is increased but there is only limited data about the nursing care to be given for the patients undergoing PCI and they concluded that there is no availability of any nursing practice guide lines focusing on nursing management in PCI, so the nurses should engage in developing guideline to support nursing practices.

**Snow et al (2008)** conducted a study to assess the effect of women and health care provider focused heart health awareness initiative on diagnostic cardiac catheterization. The data used for the study was the American College of Cardiology National Cardiovascular Registry. The study revealed that only 7.03% in men and .96% women received cardiac catheterisation. This study was associated with a structured intervention focused on health care providers and women in the interventional hospital.

**Steffenino et al (2007)** evaluated the effectiveness of video based patient information before percutaneous cardiac interventions. The aim of the study was to assess whether information given prior to the procedure has any effect on the knowledge of the patient using a pre- experimental one group pre and post- test design. The sample size for the study was 108 patients undergoing coronary angiography. The data was collected using a standard information sheet. After the video, the patients were given the same multiple choice questionnaire. The study findings revealed that the knowledge had increased from 39% to 77% ($p<0.0001$) after watching the video. They concluded that watching video before the procedure improves the knowledge.

**De Lima et al (2006)** had conducted a study to assess the knowledge of nurses regarding nursing diagnosis for patients after heart catheterization. The study was conducted with 30 samples after cardiac catheterization aiming to establish nursing diagnosis according to (NANDA). The method of data collection was based on nursing process related to OREMS self-care deficit theory. In the end of the study nearly 25 nursing diagnosis have been established.

**East & Jacoby (2005)** explored a study to assess the effectiveness of nursing staff education program on compliance with central line care policy in the cardiac intensive care unit. The aim of the study was to demonstrate the effectiveness of education program for staff nurses regarding central line policy. A quasi-experimental pre and post-test design was used in the study with a sample size of 47 staff nurses. After pre-test, a self-learning module was given for the nurses and followed by conduction of post-test. Pre and post test results were used to analyse the effectiveness of the educational module and the results showed a remarkable improvement in the compliance policy ($p<0.0001$)

**Chan & Cheung (2003)** assessed the effects of education on anxiety among Chinese patients undergoing cardiac catheterization. The aim of the study was to evaluate the effect of education in reducing anxiety among patients undergoing cardiac catheterization. The design used in the study was randomised experimental design. The study was conducted in regional hospital in Hong Kong. The sample size for the study was 62 patients undergoing cardiac catheterization and they were randomly assigned in the experimental and control group with 31 in each. The data was collected using State Anxiety Inventory and knowledge was also assessed following the group education on cardiac catheterization. The study findings revealed that the experimental group has experienced low anxiety level than the control group ($p<0.001$).

**Wolf et al (2003)** conducted a study to evaluate the relationship between nurse caring and patient satisfaction in patients undergoing invasive cardiac procedure. The design used for the study was observational study with 73 patients undergoing interventional cardiology. The study findings revealed strong relationship between caring and patient satisfaction ($r=0.53$, $p=0.01$). The study concluded that as caring increase, the patient's satisfaction also increases and there is no difference in opinion between male and female since caring is considered as fundamental nature of nursing, practising nurses must be appreciated for their satisfaction.

**Mott (1999)** conducted a study on psychological preparation to decrease anxiety associated with cardiac catheterization to compare the preparatory informative strategies in reducing anxiety before cardiac catheterization. The study was done with a sample size of 30 and the pre intervention and post intervention anxiety level was assessed. The study validates that psychological preparation is helpful in reducing the patient's anxiety before a stressful experience such as cardiac catheterization and this study contributes to nursing knowledge that psychological preparation is more effective for patients undergoing any invasive procedures.

**Manuel & Wayne (1999)** evaluated critical care nurses to assess the knowledge and understanding of nursing personal with a sample size of 60 and the study showed that the mean knowledge score was 48.5% for nurses who had several years of experience in critical care unit. The study revealed that current teaching practices need to be re-evaluated and specific policies should be considered.

**Steven et al (1998)** assessed the impact of providing an educational video tape referred for coronary angiography to find out its effect on outcome of care. The study design was randomised control clinical trial with a sample size of 217 patients admitted for coronary angiography. The study findings revealed that, those who received the video tape were having more knowledge than the patient who received normal care with a mean score of 85 versus 58% at ($p<0.0001$).

### 2.2.2 Section B: Literature related to practice regarding coronary angiogram care

**Foji et al (2015)** had done a study to evaluate the effect of guided imagery on pain, anxiety and other hemodynamic factors in patients undergoing coronary angiography. The aim of the study was to assess whether guided imagery has any effect on pain and anxiety in patients undergoing coronary angiography. The study design was random clinical study with a sample size of 62 patients undergoing coronary angiography. The samples were randomly assigned to experimental and control group. The data was collected using hemodynamic variable sheet, STAI anxiety questionnaire and a pain scale. The intervention was given to the experimental group and they were asked to listen to a guided imagery CD for 18 minutes. The study findings revealed that the mean level of anxiety for the experimental group had decreased significantly and the pain scale showed control group had slower level of pain but it was not statistically significant.

**Mc Connel et al (2013)** had done a study on management practices and quality of care in cardiac units to improve the quality of health care. The study design used was multivariate analysis to assess the practice of health care profession in four dimensions such as standardising care, key performance, setting target and incentivising in the cardiac units of US hospitals. 597 cardiac units were selected representing 51.5% of hospitals with interventional cardiac catheterization lab. The study findings revealed that 20% of hospitals scored 4 or 5 concluding that correlation associated with management practices and readmission ($p<0.05$).

**Kalyani et al (2013)** had done a qualitative study on Iranian patient's expectation about coronary angiography. The aim of the study was to explore the Iranian patient's expectation regarding coronary angiography. The study design was a descriptive

exploratory qualitative study done between 2011 and 2012 with purposive sample of 15 patients including 7 men and 8 women. The data was collected using semi-structured interview method. The data were analysed using qualitative content analysis approach. The study findings revealed that the expectation of the patients regarding coronary angiography were categorised under 4 main themes such as from the treatment team, need for preparation of angiography, education and training. The study concluded that the nursing care during the preparation should focus on patient's education and preparation, which can promote the quality of care and satisfaction of patients.

**Chair et al (2012)** assessed the effect of early ambulation after trans femoral cardiac catheterization in Hong Kong. The aim of the study was to rule out whether early ambulation has any effect on patient's back pain, puncture site pain, vascular complication, urinary discomfort and satisfaction level. The study design was single blind randomised control trial with a sample size of 137 participants. The samples were randomly assigned 63 in experimental and 74 in control group. The experimental group were ambulated at 4 hours after cardiac catheterization and the control group was given the routine care of 12 to 24 hours. The results were assessed using chi-square test, multiple logistic regressions. The study findings revealed that ambulation at 4 hours reduces patient's back pain ($p<0.001$), decreased urinary output ($p=0.03$) and increased general wellbeing ($p=0.005$) and it had no effect on puncture site pain and satisfaction of patient's.

**Zolfaghari et al (2012)** evaluated the effect of therapeutic touch on anxiety, vital signs and cardiac dysrhythmia in women undergoing cardiac catheterization. The study design adopted was quasi experimental study with random sampling consisted of 23 in interventional group, 23 in control group and 23 in placebo group between 35 to 65 years who had no history of any hallucination, anxiety or other physiological problem. Data collected using Spiel Berger's anxiety test, cardiac dysrhythmia sheets and vital signs sheet. The study findings showed therapeutic touch cause, reduction in anxiety level ($p<0.0001$), reduction in cardiac dysrhythmia ($p>0.0001$) and regulation of vital signs ($p>0.0001$) in the intervention group. The study concluded that therapeutic touch has an effect on reducing the anxiety among patients undergoing cardiac catheterization.

**Conway et al (2012)** conducted a study to identify risk factors for impaired respiratory function during nurse administered procedural sedation and analgesia in catheterization lab with an aim to identify pre-procedural risk factor. The design for the study was retrospective matched case control with 21 cases of impaired respiratory function and 113 controls over 18 years of age. The findings revealed that case patients were two times more likely than control to have impaired respiratory function ($p<0.05$)

**Chang et al (2011)** conducted a study to identify the psycho physiological response to sedative music in patients waiting for cardiac catheterization. The study design was a randomised control trial with a sample size of 54 aged between 47 and 70. The samples were randomly assigned to music group (27) and control group (27). The samples in the music group were allowed to listen to music for 30 minutes. The findings revealed that there is significant reduction in the level of anxiety ($p=0.003$) among experimental group.

**John et al (2010)** conducted a study to develop guidelines following a PCI. The study was done among the American and Australian registered nurses using a web based survey consisting of 116 items. 148 nurses attempted the survey and 110 nurses completed all the items. The study concluded that the survey identified diversity of practice patterns and range of educational needs. They developed a guide line based on the survey to promote quality of care and improved patient outcome.

**Sedlacek & Newsome (2010)** conducted a study in identifying vascular complications after cardiac catheterization by developing and implementing cardiac catheterization risk predictor tool. A practice team of Christ medical centre Oak Lawn after an extensive review of literature developed a cardiac catheterization risk predictor tool with an aim to identify the risk factors for developing vascular complications in the post- catheterization period. Afterwards a retrospective study was done using the risk predictor tool to rule out vascular complications. The findings revealed that the tool was effective in identifying patients who are at high risk for bleeding.

**Robyn & Renee (2010)** conducted a study to identify pre-procedural consents and anxiety assessments in patients undergoing coronary angiography and PCI. The study was done by survey method using Spiel Berger's state anxiety inventory (STAI)

and face anxiety scale. The study findings revealed that the anxiety was more common mostly in men with an average age of 66.73 (p=0.001). They concluded that patients undergoing coronary angiogram and PCI have moderate anxiety before the procedure.

**Ran & Choi (2009)** conducted a study in to assess the factor predicting patient's discomfort after coronary angiography. The purpose of the study was to identify the factors that predict discomfort after coronary angiogram among hospitalized patients. The study was done with a sample size of 203 patient's and the result revealed that pre-experience reduces the anxiety level and nurse should educate the patient's to reduce their physical and emotional discomfort.

**Walker et al (2008)** compared the complications during percutaneous coronary intervention (PCI) when patient's mobilised at 3, 4 and 6 hours after femoral sheath removal. The aim of the study was to rule out complications during early ambulation after PCI. The samples were patients undergoing PCI at public hospital Brisbane. The site was assessed on the next day of sheath removal and found that there is no evidence of complications. The study revealed that the length of bed rest after femoral sheath removal had no significant effect on bleeding (p=0.21) or hematoma formation (p=0.612) among patient's mobilised at 3, 4, 6 hours after sheath removal.

**Schiks et al (2007)** evaluated the performance of arterial femoral sheath removal by registered nurses after PCI. The aim of the study was to evaluate the nurse's performance during arterial sheath removal with the help of a protocol. The design adopted was observational study. The sample size was 42. An extensive training was given to the staff nurses regarding sheath removal and a checklist was developed consisting of 10 elements and 65 items. The study findings revealed that no one has achieved a total score of more than 90% and 4 elements in the checklist scored more than 90% and three elements with less than 80%. The study concluded that even though excellent performance was not achieved, the training helped the staff nurses to improve the current performance.

**Rezaci et al (2006)** evaluated the effect of changing position and early ambulation after cardiac catheterization. The design adopted for the study was single blind randomised control trial with a sample size of 70, with 35 in control and 35 in

experimental group. The patient's in the experimental group were positioned during the first 6 hours and within 7 hours they were ambulated and the samples in the control group were managed routinely. The study revealed that the patient's in the experimental group showed significantly higher comfort ($p<0.01$). The study concluded that the level of comfort and satisfaction is related to duration of bed rest and position of patient in bed.

**Maud et al (2006)** had done a study to explain the patient's experience during and after coronary angiography. The study approach used was a qualitative content analysis, with a sample size of 14 patients. Data was collected by interview method under 4 main category including emotional thoughts, bodily sensation, nursing intervention and personal strategies. The study findings revealed that all patients made a comment on staff conduct and mentioned that nursing actions during coronary angiogram have got great importance.

**Stables et al (2004)** explored a randomised control trial to compare a nurse practitioner to medical staff in preparation of patient for diagnostic cardiac catheterization. The aim of the study was to compare a nurse practitioner with a medical staff in preparing patients for cardiac catheterization. The study design adopted was randomised control trials. The sample size for the study was 339 patients selected for diagnostic cardiac catheterization and were randomly allotted for each group. The study findings revealed a score of 98.8% in nurse practitioner and 93.35% in medical staff ($p=1.0$) and patient satisfaction was found to be high in nurse practitioner group ($p=0.04$). The study concluded that the patient preparation for cardiac catheterization was safely done by nurse practitioners.

**Conway et al (2002)** carried out a study on evaluation of angiography performed by radiographers and nurses. The aim of the study was to assess the angiography performed by nurses and radiographers. Initially a protocol regarding angiography was made which was trust's risk management committee. This was followed by training on angiography, two experienced radiographers and one nurse did angiography for 187 patients based on the protocol. The angiogram was done using three F catheter through femoral approach. The study findings revealed that 172 patients underwent cardiac catheterization without any help from the radiologist. Only 15 cases (8%) required some

sort of assistance from the radiologist. The study concluded that experienced nurses and radiographers can perform the diagnostic angiography safely and efficiently by acquiring skills.

**Higgins et al (2001)** conducted a qualitative study on preparing patients for coronary angiography regarding the patient's experience. The objective of the study was to obtain participants experience regarding preparation for coronary angioplasty. The design used for the study was based on grounded theory. The samples consisted of 8 men and 3 women who were interviewed one month after the procedure. Verbatim transcripts were analysed using the themes of qualitative technique. The study was done in three steps. Step one was problem identification, step two coping responses and step three results of coping responses were evaluated. The study findings revealed that, the preparation period was a period of adjustment which provoked the anxiety level of the patient. The study concluded that the psychological aspect of nursing care has got an important role during the preparation of patients for angioplasty.

**Morgan et al (2001**) conducted a study on diagnostic angiography performed by nurses in UK. The aim of the study was to assess the practicability of nurse doing coronary angiography. An extensive training on techniques of arterial catheterization was given for the staff nurses, followed by the nurses performed coronary angiography for 68 patients under supervision of doctors. The study findings showed that out of 68 procedures 58(85%) was successful and there was only mild complications for the patients (p=1.0). The study concluded that it is feasible and safe for appropriately trained nurses to perform angiography.

**Mccabe et al (2001)** evaluated the nursing care after diagnostic coronary angiography to rule out the prevalence of femoral complications after the procedure. A retrospective study was done by observing the records of 306 in-patients in the development of femoral complications. It was associated with the practice using Wilcoxon rank sum test and Chi-square test. The study findings revealed that there were 8.85% hematoma, 4.5% bleeding, 1% pseudo aneurysm and 0% thrombosis and the association revealed that complication was not related to nursing care practices.

**Betty et al (2001)** conducted a study to evaluate "coronary angiography observation- whether it is an evidence based or ritualistic practice". The aim of the study was to identify the occurrence of femoral artery bleeding in the first 6 hours of the coronary angiography to find the relationship between existing post-angiogram protocol and complications. The design was prospective descriptive study with 55 patients. The study revealed that 4.2% of the patient's had bleeding within 6 hours of angiography and required manual compression ($p>0.05$). The study concluded that the use of pressure bandage had significant effect on occurrence and pattern of bleeding.

**Keeling et al (2000)** had done a study in reducing time in bed after percutaneous trans-luminal coronary angiography (PTCA). The aim of the study was to evaluate whether reduction in bed rest after the procedure will develop any complications. The study design used was a prospective experimental – control group design with randomization. The samples were allocated to both experimental and control group consisting of 51 samples in each group. The experimental group was allowed to be in the bed for 4 hours and the control group remained in the bed for 6 hours after sheath removal. The study findings revealed that majority of the samples in the experimental group did not have any bleeding from the puncture site ($p<0.001$). The study concluded that reduction in bed rest had no effect on developing complications.

**Zevola & Maier (1999)** conducted a study on improving the care of cardiothoracic surgery through advanced nursing skills, with a sample size of 20. The skills of the staff nurses were assessed during annual evaluation and the new staff nurses were certified using the process of attending in-service training program and demonstrating the skill three times. The study revealed a tremendous improvement in the quality of care and provided an increased autonomy for the nurses.

**Keeling et al (1994)** had done an experimental study on post cardiac catheterization time-in-bed study to enhance patient comfort through nursing research. The study was conducted with two groups. One group remained in bed for 12 hours and the other group remained in bed for 6 hours post procedure. The study revealed that there was no significant difference in incidence of bleeding from catheter insertion site between the two groups and it was concluded that decrease in time reduces bed cost and patient's discomfort.

**Juran et al** conducted a study to assess the nursing intervention to decrease the bleeding at the femoral site access after PCI. The design was descriptive correlational study with a sample size of 4010 patients who had nursing care intervention after PCI. The study revealed that significant correlation exists between nursing intervention and occurrence of moderate to severe bleeding in the access site. The study concluded that most of the nursing intervention aimed at reducing the bleeding at the vascular site without any clinical research to validate the nursing care.

### 2.2.3 Section C: Literature related to complications related to coronary angiogram care

**Dal Molin et al (2015)** conducted a study to assess bed rest for preventing complications after trans-femoral cardiac catheterization, a protocol of systematic review and network meta-analysis. The aim of the study was to assess the length of bed rest during post catheterization period has any effect on bleeding, hematoma and any other vascular complications. They prepared a protocol based on preferred reporting items for systematic reviews and meta-analysis protocol statement. They compared early mobilization with late mobilization. The study design was randomised control design.

**Kim et al (2013)** conducted a "meta-analysis of complications as a risk factor for early ambulation after percutaneous coronary intervention". The aim of the study was to assess, whether early ambulation has any effect on vascular complications in patients undergoing coronary interventions. The design adopted for the study was retrospective design. Bias was corrected using regression analysis and the risk ratio of bleeding and hematoma at the puncture site was assessed using odds ratio and forest plot. The study finding revealed that early ambulation had significance on hematoma formation (OR = 0.89, CI = 0.68) and bleeding (OR = 1.12, CI = 0.77). The study concluded that early ambulation after percutaneous coronary intervention has no effect on hematoma formation and bleeding at puncture site.

**Calel & Constantino (2012)** conducted a study to identify the strategies to decrease vascular complications in diagnostic cardiac catheterization patient. The aim of the study was to reduce vascular complications such as hematoma, pseudo aneurysm, arteriovenous fistula, peripheral artery occlusion and dissection. The American college of cardiovascular data registry reported that the vascular complications are less than 1%

for diagnostic procedures and less than 35 for PCI and the result showed that half of the medical errors are vascular related. The study concluded that specific strategies should be formulated to decrease the vascular complications.

**Cosman et al (2011)** conducted a study to assess the prevalence of bruising at the vascular access site one week after elective cardiac catheterization or PCI. The aim of the study was to rule out the prevalence of vascular access site bruising within 5-7 days of cardiac catheterization. The design adopted for the study was prospective observational study with a sample size of 172. The data was collected from chart review, pre-discharge assessment and telephone follow-up after 5-7 days of discharge. The study findings revealed that telephone follow up reported 68.6% of vascular access site bruising with 47% reported bruise greater than 7.5cm. There was a significant association between sex (females) and post discharge bruising ($p = 0.001$). The study concluded that majority of the patients had vascular access site bruising and had a significant increase among the women.

**Charlotte et al (2010)** conducted a pilot study to assess the effect of modified positioning and mobilization on back pain and delayed bleeding among patients received heparin before angiogram. The design used in the study was experimental research design with a sample size of 29. Randomised sampling technique was used in the study. The experimental group was ambulated 4 hours after angiography and bed was elevated to 45 degree whereas control group were treated normally. The pain was assessed using McGill pain intensity scale and the findings revealed that, experimental group had significantly less pain ($p=0.02$) and there was no difference in bleeding. So the study concluded that modified position reduced back pain after angiogram.

**Ahmed et al (2009)** conducted a study to assess the angiographic predictors of the vascular complication among women undergoing angiography. 30 consecutive female patients with major bleeding during the year 2004 – 2009 in a single centre were selected. Their age and procedure was matched with 90 controls with no vascular bleeding. The findings revealed that women with smaller femoral arteries are at higher risk for developing bleeding and vascular complications than women with larger arteries ($p<0.09$).

**Johan et al (2008)** conducted a study to evaluate the effect of early mobilization for patients undergoing coronary angiography, focusing on reducing vascular complications and back pain. A randomised control trial with 104 samples undergoing coronary angiogram was selected. The patients discomfort was measured at self-perceived grade of pain. The findings revealed that presence of hematoma more than 5 cm was 5.8% in experimental group when compared to control group it was 3.8%. So they concluded that early ambulation after coronary angiogram is safe without altering the occurrence of vascular complications.

**Tsuchida et al (2007)** evaluated the effectiveness of a nurse-initiated intervention in reducing catheter-associated bloodstream infections in an urban hospital. The design used was an intervention study before and after comparison. The study was conducted in 560 bedded hospital located in urban area in Japan. The patients included in the study were those who enrolled in the hospital between April 2000 and December 2002. During the first year, the infection control nurse assessed the catheter-associated bloodstream infections and in the following two years interventions were implemented such as enhanced skin preparation, new methods in inserting catheters, educating the staff to maintain sterile precautions. The study findings revealed that, the infection rate has declined from 4.0 to 1.1 ($p<0.005$).

**Altioket al (2007)** conducted a study to assess the methods to prevent femoral arteriotomy complications and contrast nephropathy among patients undergoing cardiac catheterization. The aim of the study was to assess the different approaches used in Turkey, in preventing femoral artery complications and contrast nephropathy among patients undergoing cardiac catheterization. The study design was a descriptive study. A questionnaire was mailed to 36 different hospitals which had active interventional cardiology units. Out of that 29 (80.5%) universities responded. The study findings revealed that in Turkey only manual pressure is used to achieve haemostasis at the femoral site with a pressure dressing and after procedure elevated the head to 50 degree. In order to prevent contrast nephropathy only intravenous saline solutions are used.

**Woodhead et al (2007)** conducted a study to determine whether, premedication with oral diazepam before coronary angiogram or coronary intervention cause increase in access site complication. The study design used was randomised control trial with a

sample size of 760 samples. They were randomly placed into either experimental group (receives diazepam 5-10mg 30 to 60 minutes prior to procedures) and control group (no medications). The study showed that there is no difference in the development of complication in the experimental or control group (p=0.58) but it reduces procedural pain.

**Steffemino et al (2006)** conducted a study on vascular access complications after cardiac catheterization. The aim of the study was to assess the vascular access complications in patients using closure devices. A nurse led prospective survey was done in patients undergoing cardiac catheterization over 4 months. Out of 564 procedures the radial and femoral accesses used were 78 and 470 respectively. And 136 closure devices were used. The study findings revealed that, severe vascular complications were very few (at p=0.004) and they concluded that, vigorous anti coagulation cause increased complications.

**Kirsten et al (2004)** conducted a study to assess hematoma after coronary angiography and PCI via the femoral artery, frequency and risk factors. The aim of the study was to assess the development of hematoma among patients undergoing PCI. The sample size for the study was 474 patients with 322 patients undergoing coronary angiography and 141 undergoing PCI and 11 patients were excluded from the study. They were assessed with 33 variable predictors and the study findings revealed that 6 patients developed more than 10% hematoma and 41 patients developed 5% hematoma and they associated their finding with risk factors and concluded that these factors increased the risk for development of hematoma.

**Hogan et al (1995)** conducted a study to assess the effect of three methods of femoral site immobilization on bleeding and comfort after coronary angiogram. The design adopted for the study was a three group experimental design and the sampling technique used was random sampling with a sample size of 300 patients. The intervention used in the study was, group one had a sand bag applied to the femoral site, group 2 had a sheet over the affected leg which was tucked under the mattress and group 3 was given a verbal instruction to keep the leg straight. Study finding revealed that the verbal instruction group had significantly more bleeding than the other groups.

**Frank et al (1988)** evaluated the infection risk of cardiac catheterization and arterial angiography using single and multiple disposable catheters. A prospective study was done among 414 patients undergoing cardiac catheterization or angiography. 161 patients were analysed with 426 single used catheters and 152 patients with 384 multiple use catheters which was re-sterilized and 101 patients with 325 multiple catheters which was reprocessed. The study findings revealed that, there is no significant difference between the three groups with respect to fever. The study concluded that single use or multiple use never increase the risk of infection.

**Elliott et al (1979)** conducted a study to assess the complications of pulmonary artery catheterization among the critically ill patients. A prospective study was done with 116 patients undergoing pulmonary artery catheterization. Out of 116 insertions 90 patients developed arrhythmias and 2 cases had staphylococcal bacteraemia originated from the catheter and 1.7% had subclavian vein thrombosis. The study concluded that there are significant complications resulted from pulmonary artery catheterization and on close monitoring the critically ill patients can lower the incidence.

# METHODOLOGY

# CHAPTER – 3

## METHODOLOGY

This chapter includes the research approach, research design, variables under study, research setting, population, sample, sample size, sampling techniques, criteria for selecting sample, method of developing questionnaire, description of research instrument, validity of the tool, reliability of the tool, ethical consideration, pilot study, data collection procedure and data analysis procedure.

### 3.1 RESEARCH APPROACH

A research approach is an applied form of research that involves finding out how a specific program, practice, procedure or policy is working well (Polit & Hungler).

The approach used in the study was quantitative approach.

### 3.2 RESEARCH DESIGN

It refers to the overall plan for obtaining answer in the research questions for testing the research hypothesis (Polit & Hungler)

The research design selected for the study was pre experimental one group pre-test and post-test design.

| **Day 1** | **Day 1** | **Day 7** |
|---|---|---|
| $O_1$ | × | $O_2$ |
| Pre-test | Intervention | Post-test |

The design used for this study is represented as

$O_1$ – Pre-test assessment of knowledge and practice regarding coronary angiogram care among staff nurses.

× – Administration of planned educational program on coronary angiogram care.

$O_2$ – Post-test assessment of knowledge and practice regarding coronary angiogram care among staff nurses.

In pre experimental one group pre-test and post-test design, the dependent variable is measured before the independent variable is introduced. After a period of

seven days the dependent variable is measured again to obtain the effect of independent variable.

## 3.3 VARIABLES

### 3.3.1 Independent Variable

Planned educational program on coronary angiogram care.

### 3.3.2 Dependent Variable

Knowledge and practice on coronary angiogram care.

### 3.3.3 Demographic Variable

Age, gender, educational level, total experience, work experience in cardiac unit and attendance at any class on coronary angiogram care.

## 3.4 RESEARCH SETTING

The study was conducted in Madras Medical Mission hospital, Mogappair Chennai, which is a cardiac speciality hospital with 283 beds and 75 coronary care beds to provide intensive care to patients after surgery or angioplasty or patients needing highly specialized management. The study was conducted in cardiac unit of MMM hospital.

## 3.5 POPULATION

### 3.5.1 Target Population

Staff nurses working in cardiac units all over Tamil Nadu.

### 3.5.2 Accessible Population

Staff nurses working in cardiac units of MMM hospital.

## 3.6 SAMPLE

Staff nurses who fulfilled the sample selection criteria.

## 3.7 SAMPLE SIZE

The sample size for the study was 60.

## 3.8 SAMPLING TECHNIQUE

Sampling technique refers to the process of selecting a group of people, events and other elements that are representative of the population being studied (Polit & Hungler).

The sampling technique adopted for this study was non probability purposive sampling.

## 3.9 CRITERIA FOR SAMPLE SELECTION

### 3.9.1 Inclusion Criteria

1. Staff nurse with less than two years of experience.
2. Staff nurse available at the time of data collection.

### 3.9.2 Exclusion Criteria

1. Those who were not willing to participate.
2. Those who were working in other than cardiac unit.

## 3.10 DEVELOPMENT AND DESCRIPTION OF TOOL

The tools used for data collection was a structured questionnaire to assess the knowledge level and an observational check list to assess the practice level of staff nurses on coronary angiogram care. The tool was developed after a thorough review of literature, opinions from experts and from personal experience. A structured questionnaire was developed to assess the knowledge on coronary angiogram care and a check list was created to assess the practice of staff nurses on coronary angiogram care.

The research tool for data collection consists of three parts.

**Part I** – Demographic variables which included age, gender, educational level, total work experience, work experience in cardiac unit and attendance at any class on coronary angiogram care.

**Part II** – Structured self-administered questionnaire to assess the knowledge of the staff nurses, regarding coronary angiogram care. It consisted of 30 questions which included the following aspects such as general concept, coronary angiogram care, pre-procedural care, post-procedural care and complications with a total score of 30. Each correct

answer was given with a score of 1 and a wrong answer with a score of 0.The total score of the tool was 30.

**Part III** – Observational check list to assess the practice of staff nurses during coronary angiogram care period. It was divided into two parts, a) Pre-procedural care check list and b) Post-procedural care check list, which consisted of 25 and 20 items respectively. This check list focused on the pre-procedural and post-procedural care to be given by the staff nurses. If the nurses perform the particular step correctly then he/she was provided with a score of 1 or else they were given a score of 0. The total score for the tool was 45.

**SCORING PROCEDURE**

**Part II: Structured Self-Administered Questionnaire**

It consisted of 30 questions. Each question had only one correct answer. Each correct answer was given with a score of 1 and wrong answer with a score of 0. So the total score was 30

The total score was converted into percentage and interpreted as follows.

- Needs improvement – < 50%
- Moderately adequate knowledge – 50% - 75%
- Adequate knowledge – > 75%

**Part III: Observational Check list**

It consists of two parts

**A: Pre-procedural check list**

Pre-procedural check list contained the list of activities to be carried out by the staff nurses while preparing the patient for coronary angiogram. It consisted of 25 items with YES or NO options. The activities carried out by staff nurses were marked as YES option and a weightage of 1 mark was given and if the activities were not performed it was marked as NO option and a weightage of 0 mark was given. The total score of the pre-procedural check list was 25 and the same was converted into percentage.

**B: Post-procedural check list**

Post-procedural check list contained the list of activities to be carried out by the staff nurses during the post coronary angiogram period. The checklist had 20 items with YES or NO options. The activities carried out by the staff nurses were marked as YES option and a weightage of 1 mark was given and if the activities were not performed it was marked as NO option and a weightage of 0 mark was given. The total score of the post-procedural check list was 20 and the same was converted into percentage

The total score of practice was 45 and the same was converted into percentage and interpreted as follows.

- Needs improvement – <50%
- Fair practice – 50% - 75%
- Good practice – > 75%

**3.11 VALIDITY OF THE TOOL**

The tool was validated by two medical experts in the field of Interventional Cardiology and three nursing experts specialized in Medical Surgical Nursing. Minor modifications were made in the tool based on expert's opinions and the suggestions were incorporated in the tool and was finalised for the main study.

**3.12 RELIABILITY OF THE TOOL**

The reliability of the knowledge tool was assessed using the test-retest method. Correlation coefficient was interpreted by using the Karl Pearson correlation coefficient.

$$r = \frac{N(\Sigma XY) - (\Sigma X)(\Sigma Y)}{\sqrt{[N\Sigma X^2 - (\Sigma X)^2][N\Sigma Y^2 - (\Sigma Y)^2]}}$$

The reliability r' was estimated by using the formula r' = 2r /1+rand the estimated reliability for the knowledge tool was **r=0.91**.

The reliability of practice tool was assessed by using inter-rater method. The estimated reliability r' value for the practice tool was **r=0.85**.

### 3.13 ETHICAL CONSIDERATION

The study was carried out after obtaining an ethical clearance from the ethical committee of MMM Hospital. The following ethical principles were followed in course of study.

| Ethical Principle | Action Carried out |
|---|---|
| Principle of beneficence | The study was done to improve the knowledge and practice of staff nurses regarding coronary angiogram care and staff nurses also gained adequate knowledge regarding coronary angiogram care. |
| Principle of respect for human dignity | Those who were willing to participate were selected as samples for the study and right to withdrawn was ensured before data collection. |
| Principle of confidentiality | The information regarding the samples and their performance were kept confidential. |
| Principle of informed consent | Informed consent was obtained from all the samples selected for the study. |

### 3.14 PILOT STUDY

The pilot study was conducted after obtaining ethical clearance from the ethical committee of the institution and also got permission from the Director Administrator, Director Cardiology department, and the Nursing Superintendent of MMM hospital. The pilot study was conducted in MMM hospital with six staff nurses working in cardiac unit which is located in separate block to assess the feasibility and practicability of the study. A brief introduction of self and the study was given to ward in-charges and with the help of them the duty shift and the patient assignment was planned for the selected staff nurses. The purpose of the study was explained to the staff nurses and confidentiality was assured. The knowledge was assessed using a self-administered questionnaire consisting of 30 questions and each of them took 15 to 20 minutes to complete the questionnaire. After that the nurses were assessed about their practices on pre and post procedural care of patient undergoing coronary angiogram without their knowledge. A criteria checklist was used to assess the pre and post-procedural care of patients

undergoing coronary angiogram. After completing the pre-test assessment of knowledge and practices of staff nurses, a planned educational program was given for the selected sample individually, regarding the various aspects of coronary angiogram. A post-test was conducted after seven days in same manner. The study found to be feasible and hence the researcher decided to follow the same procedure in the main study.

**3.15 DATA COLLECTION PROCEDURE**

The main study was conducted after obtaining ethical clearance from the ethical committee of the institution and also got permission from the Director Administrator, Director Cardiology department and the Nursing Superintendent of MMM hospital.

Sixty staff nurses were selected based on the sample selection criteria using non probability purposive sampling in coordination with the ward in-charges. A brief introduction about self and the study was given to ward in-charges and with the help of them the duty shift and the patient assignment was planned for the selected staff nurses. The purpose of the study was explained to the staff nurses and confidentiality was assured.

The data collection was carried out in three phases as pre-assessment or initial phase, intervention phase and post-assessment phase. Ethical principles such as principle of beneficence, principle of human dignity, principle of confidentiality and principle of informed consent were followed by the researcher throughout the study. The data collection was done over a period of 4 weeks.

In the initial or pre assessment phase a good rapport was established with the staff nurses. The knowledge was assessed using a self-administered questionnaire consisting of 30 questions and each of them took 15 to 20 minutes to complete the questionnaire. After that the nurses were assessed about their practices on pre and post-procedural care of patients undergoing coronary angiogram without their knowledge. A criteria checklist was used to assess the pre and post-procedural care of patients undergoing coronary angiogram.

In the phase II, the staff nurses who completed the pre-test were given a planned educational program in groups using power point presentation and each session lasted for

1 ½ hours. The programme covered the general aspect of coronary angiogram, its indications, contra indications, pre-procedural care, post-procedural care and complications. All the staff nurses participated in the educational program with great interest.

In phase III, a post test was conducted after 7 days from the day of planned educational programme with the same self-administered questionnaire and observational check list for the same group in same manner which was followed in pre-test.

| Phases of Data Collection | Activity Done | Time and Duration |
|---|---|---|
| **Phase I**<br>Initial or Pre-assessment phase | Pre-test assessment of knowledge and practice regarding coronary angiogram care | Each individual took 15 – 20 minutes to complete the self-administered questionnaire and for practice it took a day to complete the pre and post procedural assessment using a check list. |
| **Phase II**<br>Intervention phase | Planned educational program on several aspects on coronary angiogram care including<br>• General concept<br>• Coronary angiogram<br>• Pre-procedural care<br>• Post procedural care<br>• Post procedural complications<br>was given using powerpoint presentation | It took nearly 1½ hours to complete each session.<br>5 – 6 sessions were conducted |
| **Phase III**<br>Post-test assessment phase | Post-test assessment of knowledge and practice regarding coronary angiogram care to observe the goal directed behaviour | Each individual took 15 – 20 minutes to complete the self-administered questionnaire and for practice it took a day to complete the pre and post-procedural assessment using a checklist |

**Fig.3.15.1: Schematic Representation of Data Collection Procedure**

## 3.16 DATA ANALYSIS PROCEDURE

Data was analysed using descriptive and inferential statistics.

### 3.16.1 Descriptive Statistics

1. Frequency and percentage distribution was used to analyse the demographic data of staff nurses.
2. Mean, standard deviation, frequency and percentage were used to assess the knowledge and practice of staff nurses.
3. Correlation coefficient was used to assess the relationship between the post-test knowledge and practices of staff nurses.

### 3.16.2 Inferential Statistics

1. Paired ‘t’ test was used to evaluate the effectiveness of planned educational program.
2. Chi-square test was used to associate the mean differed knowledge and practice of the staff nurses with their selected demographic variables.

# DATA ANALYSIS AND INTERPRETATION

# CHAPTER – 4

## DATA ANALYSIS AND INTERPRETATION

This chapter deals with analysis and interpretation of the data collected from sixty staff nurses at selected hospital, Chennai. The data collected was organized, tabulated and analysed according to the objectives. The findings based on the descriptive and inferential statistical analysis are presented under the following sections.

### ORGANIZATION OF THE DATA

Data collected were organised under the following sections.

**Section A:** Assessment of demographic variables of the staff nurses

**Section B:** Assessment of pre-test and post-test level of knowledge and practice regarding coronary angiogram care among the staff nurses.

**Section C:** Assessment of relationship between post-test knowledge and practice score regarding coronary angiogram care among the staff nurses.

**Section D:** Assessment of effectiveness of planned educational programme on level of knowledge and practice regarding coronary angiogram care among the staff nurses.

**Section E**: Assessment of association of mean differed level of knowledge and practice regarding coronary angiogram care of staff nurses with their selected demographic variables.

**SECTION A: ASSESSMENT OF DEMOGRAPHIC VARIABLES OF THE STAFF NURSES.**

**Table 4.1: Frequency and percentage distribution of demographic variables of staff nurses**

**N = 60**

| Demographic Variables | Characteristics | No. | % |
|---|---|---|---|
| **Age in years** | 21 – 23 | 56 | 93.33 |
| | 24 – 26 | 4 | 6.67 |
| | 27 – 28 | 0 | 0 |
| | >28 | 0 | 0 |
| **Gender** | Male | 0 | 0 |
| | Female | 60 | 100.0 |
| **Educational level** | General Nursing | 3 | 5.0 |
| | B.Sc. Nursing | 57 | 95.0 |
| | Post Basic Nursing | 0 | 0 |
| **Total years of experience** | 0 - 6 months | 47 | 78.34 |
| | 7 months - 1 year | 9 | 15.0 |
| | 1 – 1½ years | 2 | 3.33 |
| | 1½ - 2 years | 2 | 3.33 |
| **Work experience in cardiac unit** | 0 - 6 months | 48 | 80.0 |
| | 7 months - 1 year | 10 | 16.67 |
| | 1 – 1½ years | 2 | 3.33 |
| | 1½ - 2 years | 0 | 0.0 |
| **Attendance at any class on coronary angiogram care** | Yes | 13 | 21.67 |
| | No | 47 | 78.33 |

The above table 4.1 shows frequency and percentage distribution of demographic variables of staff nurses.

With regard to age in years, majority 56(93.33%) of the samples were in age group of 21 – 23 years, and only 4 (6.67%) of them were in the age group of 24 – 26 years and none of the samples falls in the age group of 27 – 28 and more than 28 years. With respect to gender all 60(100%) of the samples were females. Regarding the

educational level, majority 57(95%) of the samples were educated up to B.Sc. Nursing, and a few 3(5%) were general nursing and none of the samples fall under post basic nursing category.

Considering the total years of the experience mostly 47(78.34%) of the samples had 0 – 6 months of experience as staff nurse and 9(15%) of the samples had 7 months to 1 year of experience. Regarding work experience in cardiac unit 48(80%) of the sample had work experience of 0 – 6 months and 10(16.67%) of the sample had 7 months to 1 year of experience. Most of the 47(78.33%) of the samples had not attended any class on coronary angiogram care.

The study findings revealed that majority of the samples were young female nurses with B.Sc. Nursing qualification. And they had nearly 6 months of experience and many of them had not attended any classes on coronary angiogram care previously.

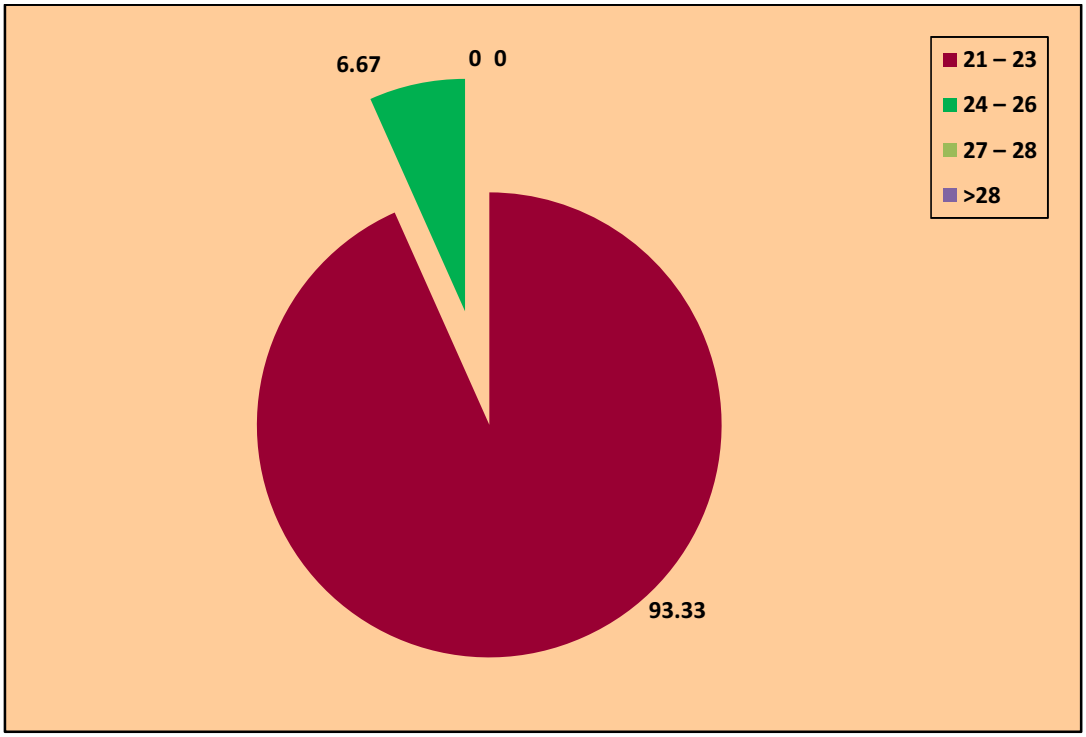


**Fig.4.1: Percentage distribution of age of the staff nurses**

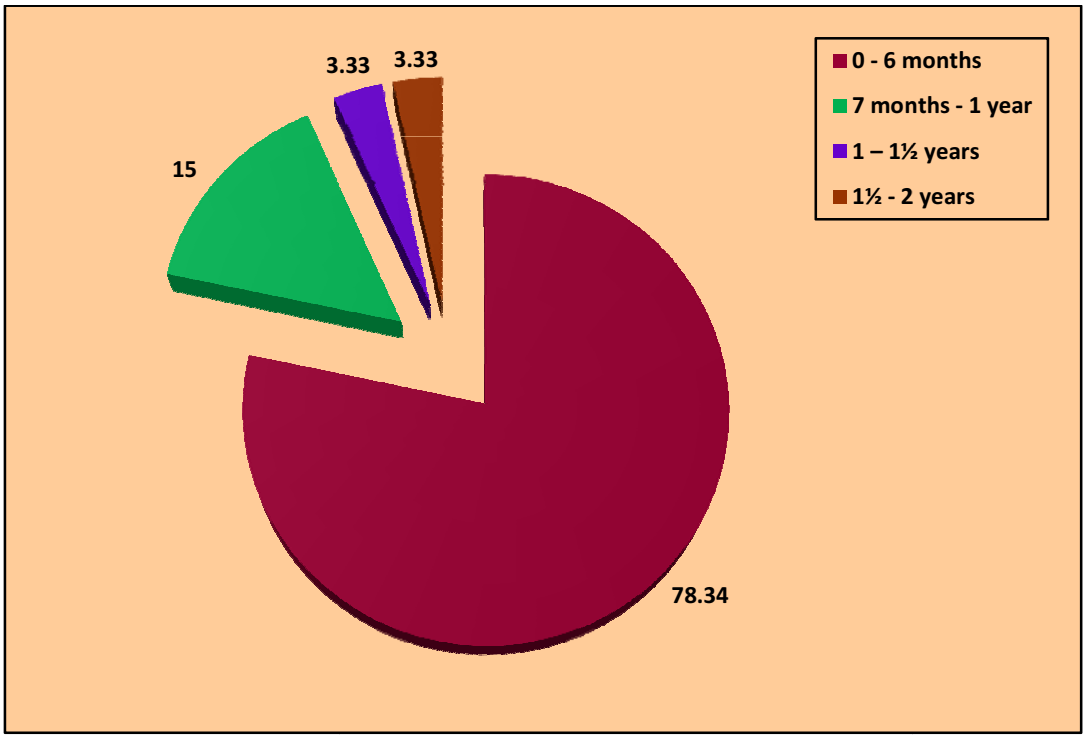


**Fig.4.2: Percentage distribution of total years of experience of the staff nurses**

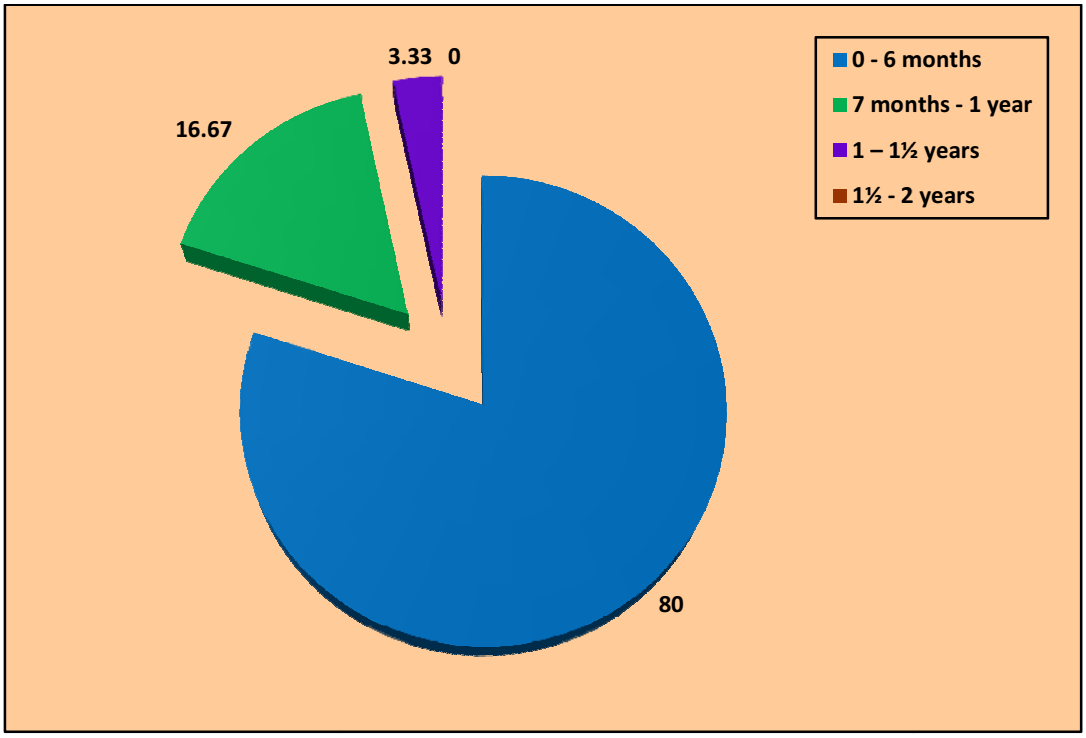


**Fig.4.3: Percentage distribution of work experience of the staff nurses in cardiac unit**

**SECTION B: ASSESSMENT OF PRE-TEST AND POST-TEST LEVEL OF KNOWLEDGE AND PRACTICE REGARDING CORONARY ANGIOGRAM CARE AMONG THE STAFF NURSES.**

**Table 4.2: Frequency and percentage distribution of aspects of pre-test level of knowledge regarding coronary angiogram care among the staff nurses**

**N = 60**

| Knowledge Domains | Needs Improvement (<50%) | | Moderately Adequate Knowledge (50 – 75%) | | Adequate Knowledge (>75%) | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| General aspects | 20 | 33.33 | 39 | 65.0 | 1 | 1.67 |
| Coronary Angiogram | 7 | 11.67 | 48 | 80.0 | 5 | 8.33 |
| Pre-procedural care | 47 | 78.33 | 12 | 20.0 | 1 | 1.67 |
| Post-procedural | 40 | 66.67 | 18 | 30.0 | 2 | 3.33 |
| Complications | 35 | 58.33 | 25 | 41.67 | 0 | 0 |
| **Overall** | **39** | **65.0** | **21** | **35.0** | **0** | **0** |

The above table 4.2 shows frequency and percentage distribution of aspects of pre-test level of knowledge regarding coronary angiogram care among the staff nurses

Regarding the knowledge on general aspects, many 39(65%) of the samples had moderately adequate knowledge and 20(33.33%) of them needs improvement in their knowledge level and only one had adequate knowledge. With respect to knowledge on coronary angiogram, majority 48(80%) of the samples had moderately adequate knowledge, 7(11.67%) of them needs improvement and 5(8.33%) of them had adequate knowledge. With regard to knowledge on pre-procedural care, most 47(78.33%) of the samples needs improvement, 12(20%) had moderately adequate knowledge and only 1(1.67%) of them had adequate knowledge.

Considering the post procedural care knowledge, many of the samples 40(66.67%) needs improvement, 18(30%) had moderately adequate knowledge and 8(13.34%) had adequate knowledge. Analysing complications it revealed that many

35(58.33%) needs improvement and 25(41.67%) had moderately adequate knowledge. The overall pre-test level of knowledge revealed that many 39(65%) needs improvement and 21(35%) had moderately adequate knowledge regarding coronary angiogram care, and none of the samples fall under the category of adequate knowledge.

When observed the knowledge score in the pre-test level majority of the staff nurses did not have adequate knowledge regarding coronary angiogram care. Nurses need improvement especially in the area of pre and post-procedural care and complications of coronary angiogram.

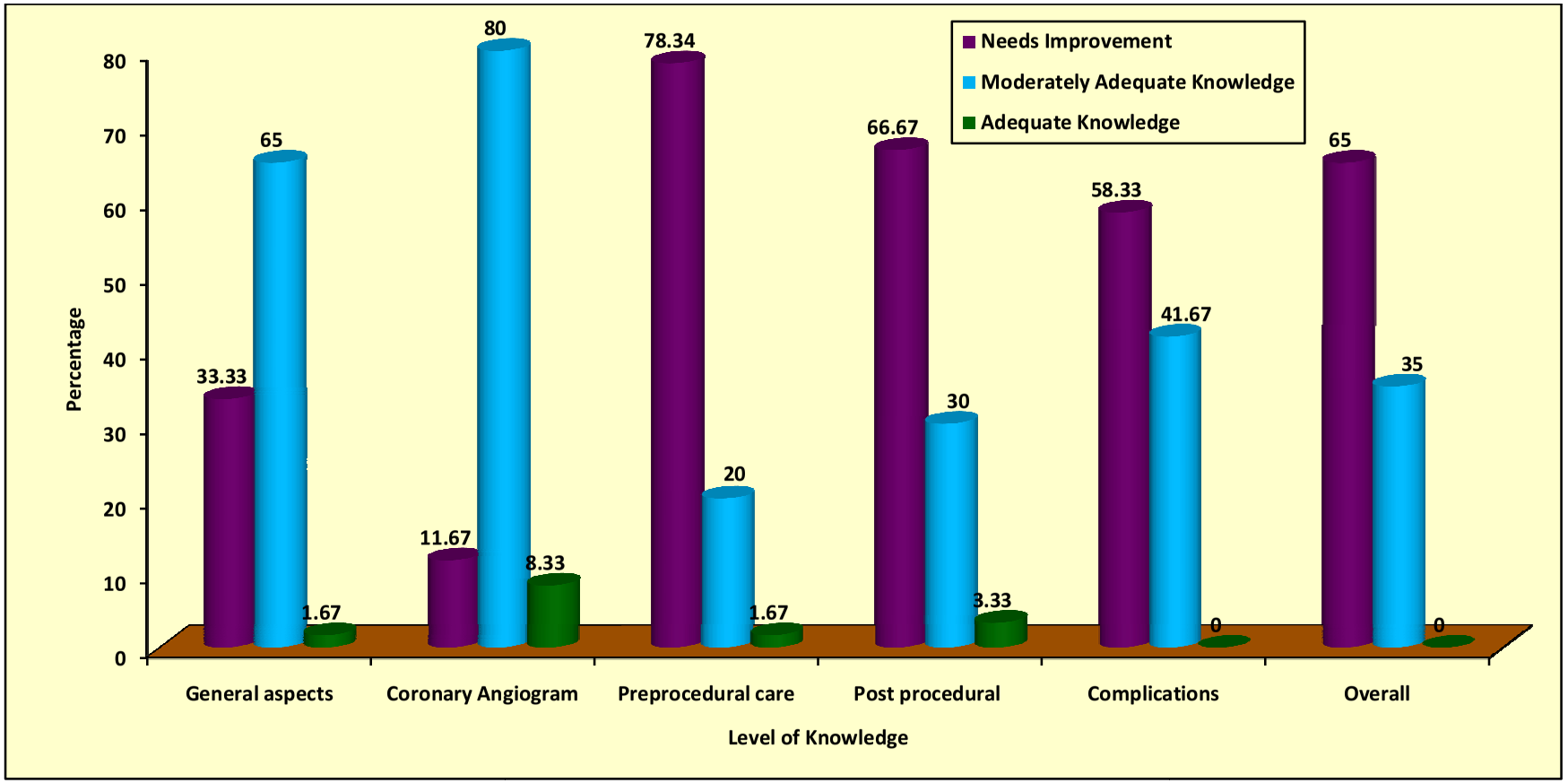


**Fig 4.4: Percentage distribution of aspects of pre-test level of knowledge regarding coronary angiogram care among staff nurses**

**Table 4.3: Frequency and percentage distribution of aspects of post-test level of knowledge regarding coronary angiogram care among staff nurses**

**N = 60**

| Knowledge Domains | Needs Improvement (<50%) | | Moderately Adequate Knowledge (50 – 75%) | | Adequate Knowledge (>75%) | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| General aspects | 0 | 0 | 13 | 21.67 | 47 | 78.33 |
| Coronary Angiogram | 0 | 0 | 29 | 48.33 | 31 | 51.67 |
| Pre-procedural care | 0 | 0 | 5 | 8.33 | 55 | 91.67 |
| Post-procedural | 4 | 6.67 | 13 | 21.66 | 43 | 71.67 |
| Complications | 4 | 6.67 | 12 | 20.0 | 44 | 73.33 |
| **Overall** | **0** | **0** | **1** | **1.67** | **59** | **98.33** |

The above table 4.3 shows frequency and percentage distribution of aspects of post-test level of knowledge regarding coronary angiogram care among staff nurses .

Regarding the knowledge on general aspects, many 47(78.33%) of them had adequate knowledge and 13(21.67%) of them had moderately adequate knowledge regarding coronary angiogram care. With respect to knowledge to coronary angiogram, most 31(51.67%) had adequate knowledge and 29(48.33%) had moderately adequate knowledge. With regard to pre-procedural care knowledge, majority 55(91.67%) had adequate knowledge and 5(8.33%) had moderately adequate knowledge.

Considering the post-procedural care knowledge, 43(71.67) had adequate knowledge, 13(21.66%) had moderately adequate knowledge and 4(6.67%) needed improvement. On analysing the complications it revealed that most 44(73.33%) had adequate knowledge, 12(20.0%) had moderately adequate knowledge and 4(6.67%) needed improvement in their knowledge level. The overall post-test level of knowledge revealed that majority 59(98.33%) had adequate knowledge and 1(1.67%) had moderately adequate knowledge regarding coronary angiogram care and none of them had inadequate knowledge.

When observed the knowledge score in the post-test level, majority of the staff nurses gained adequate knowledge regarding coronary angiogram care after the planned educational program. A few nurses need improvement in the post-procedural care and complications aspects of coronary angiogram.

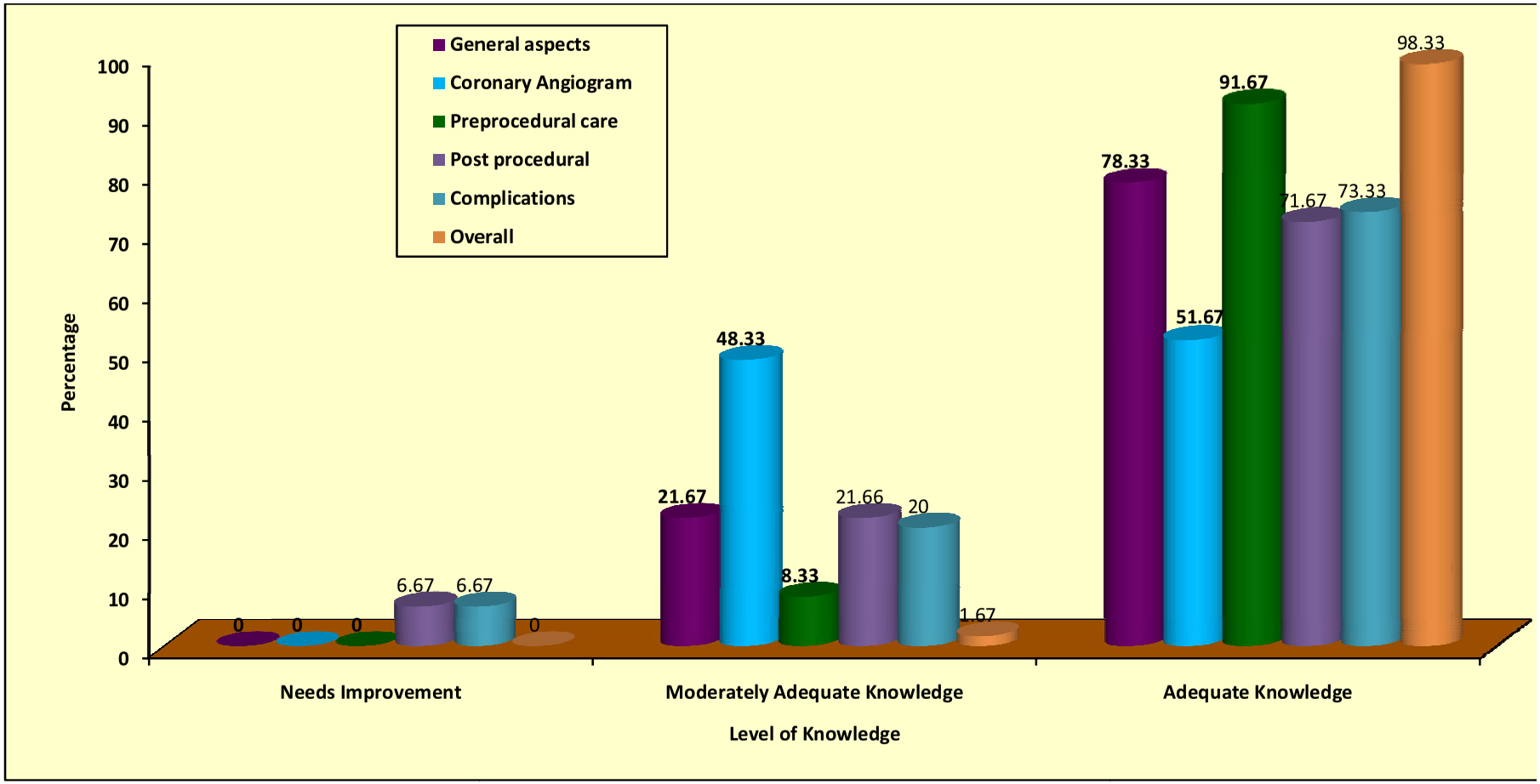


**Fig.4.5:Percentage distribution of aspects of post-test level of knowledge regarding coronary angiogram care among staff nurses**

**Table 4.4: Mean and S.D of knowledge of the staff nurses in the pre and post-test period**

**N = 60**

| Knowledge | Mean | S.D |
|---|---|---|
| Pre-test | 13.0 | 3.71 |
| Post-test | 26.98 | 1.89 |

The above table 4.4 shows mean and S.D of knowledge of the staff nurses in the pre and post-test period

The study revealed that the pre-test mean score of knowledge was 13.0 with the S.D of 3.71 where as in the post-test the mean score of knowledge was 26.98 with the S.D of 1.89.

The findings revealed that mean knowledge score is increased in the post-test which in turn indicate the effectiveness of planned educational program.

**Table 4.5: Frequency and percentage distribution of aspects of pre-test level of practice regarding coronary angiogram care among the staff nurses**

**N = 60**

| Practice Domains | Needs Improvement (<50%) | | Fair Practice (50 – 75%) | | Good Practice (>75%) | |
|---|---|---|---|---|---|---|
| | **No.** | **%** | **No.** | **%** | **No.** | **%** |
| Pre-procedural care | 3 | 5.0 | 57 | 95.0 | 0 | 0 |
| Post-procedural care | 49 | 81.67 | 11 | 18.33 | 0 | 0 |
| **Overall** | **30** | **50.0** | **30** | **50.0** | **0** | **0** |

The above table 4.5 shows frequency and percentage distribution of aspects of pre-test level of practice regarding coronary angiogram care among the staff nurses

Regarding the practices on pre-procedural care, majority 57(95%) samples had fair practice and 3(5%) needed improvement on practice regarding coronary angiogram care. With respect to practice on post-procedural care, majority 49(81.67%) of samples needs improvement and 11(18.33%) had fair practice regarding coronary angiogram care. The overall pre-test level of practice revealed that 30(50%) had fair practice and30(50%) needed improvement and none of the samples had good practice regarding coronary angiogram care.

The study findings revealed that, none of the samples had good practice on pre-procedural care and post-procedural care regarding coronary angiogram care. Nurses need to improve their practices especially in the post procedural care aspect.

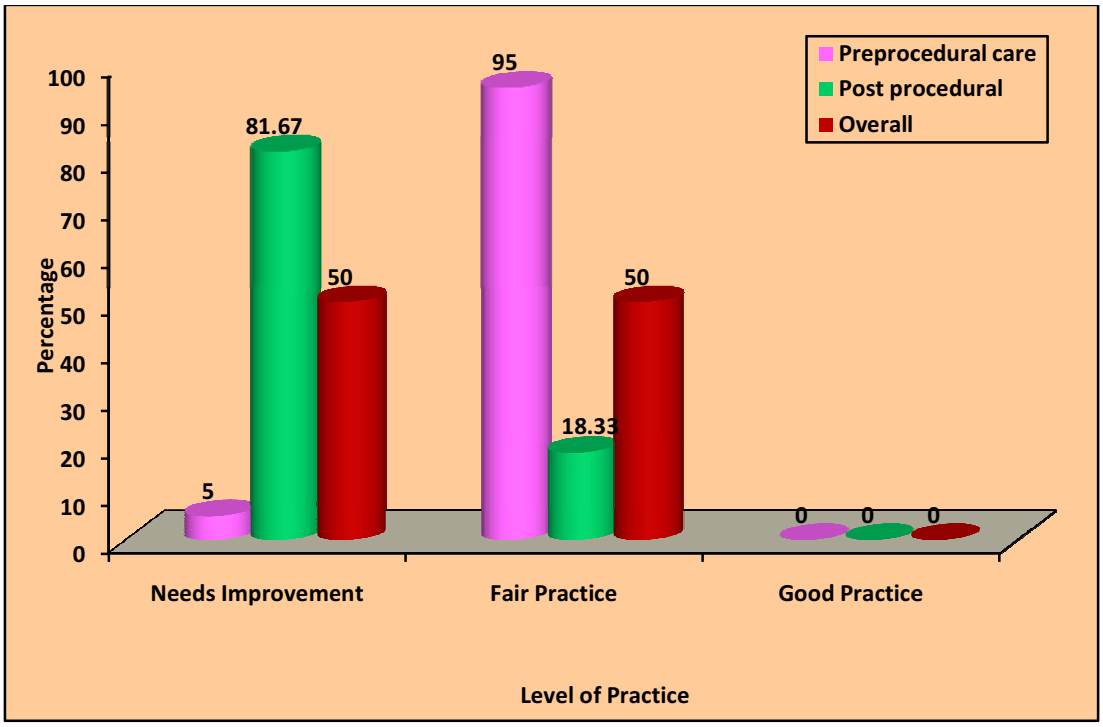


**Fig.4.6: Percentage distribution of aspects of pre-test level of practice regarding coronary angiogram care among staff nurses**

**Table 4.6:Frequency and percentage distribution of aspects of post-test level of practice regarding coronary angiogram care among staff nurses**

**N = 60**

| Practice Domains | Needs Improvement (<50%) | | Fair Practice (50 – 75%) | | Good Practice (>75%) | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Pre-procedural care | 0 | 0 | 0 | 0 | 60 | 100.0 |
| Post-procedural care | 0 | 0 | 0 | 0 | 60 | 100.0 |
| **Overall** | **0** | **0** | **0** | **0** | **60** | **100.0** |

The above table 4.6 shows frequency and percentage distribution of aspects of post-test level of practice regarding coronary angiogram care among staff nurses

Regarding practices on pre-procedural care, all 60(100%) had good practice regarding coronary angiogram care. With respect to practices on post-procedural care, all 60(100%) had good practice regarding coronary angiogram care. The overall post-test level of practice revealed that all 60(100%) had good practice regarding coronary angiogram care.

The study revealed that all the samples had good practices on pre-procedural and post-procedural care regarding coronary angiogram care which revealed the effectiveness of planned educational program in improving the practices of staff nurses.

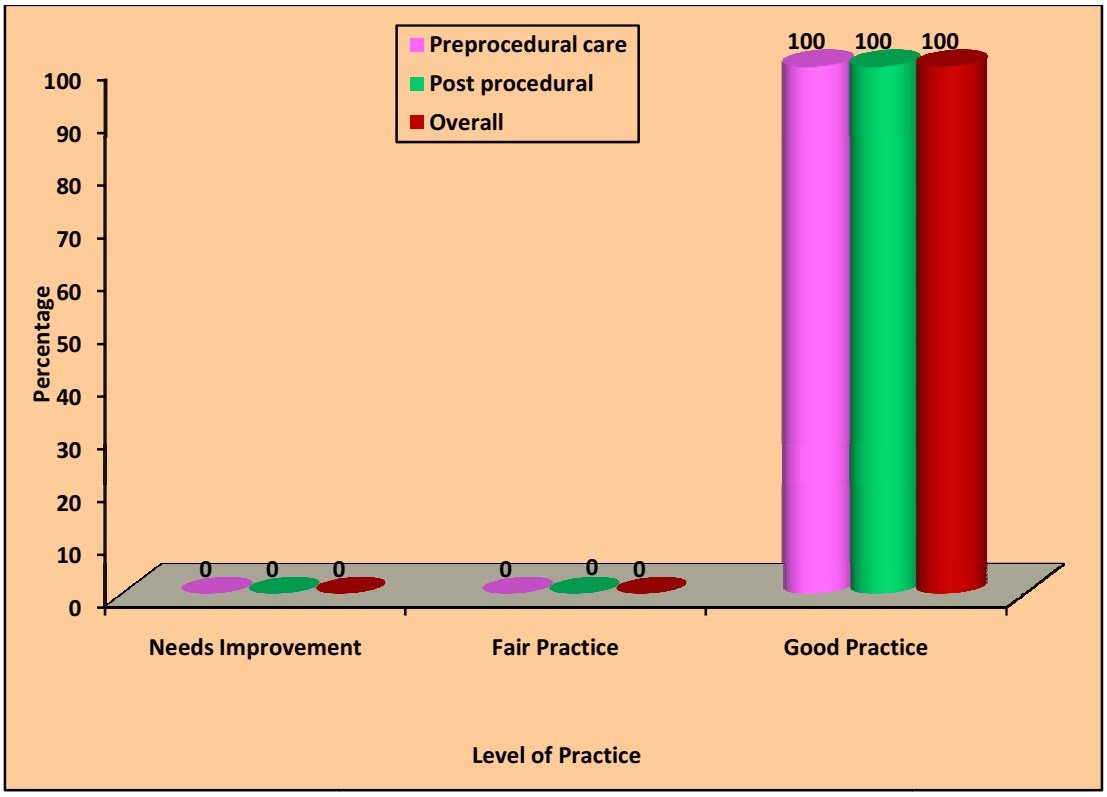


**Fig.4.7: Percentage distribution of aspects of post-test level of practice regarding coronary angiogram care among staff nurses**

**Table 4.7: Mean and S.D of practices of staff nurses regarding coronary angiogram care in the pre and post-test period**

**N = 60**

| Practice | Mean | S.D |
|---|---|---|
| Pre-test | 22.63 | 2.01 |
| Post- test | 40.75 | 1.51 |

The above table 4.7 shows mean and S.D of practices of staff nurses regarding coronary angiogram care in the pre and post-test

The study revealed that pre-test mean score of practice was 22.63 with the S.D of 2.01 whereas in the post-test the mean score of practice was 40.75 with the S.D of 1.51.

The findings revealed that mean practice score is increased in the post-test which in turn indicate the effectiveness of planned educational program.

**SECTION C: ASSESSMENT OF RELATIONSHIP BETWEEN POST-TEST KNOWLEDGE AND PRACTICE SCORE REGARDING CORONARY ANGIOGRAM CARE AMONG THE STAFF NURSES.**

**Table 4.8: Relationship between post-test knowledge and practice score regarding coronary angiogram care among staff nurses**

**N = 60**

| Variables | Mean | S.D | 'r' Value |
|---|---|---|---|
| Knowledge | 26.93 | 1.89 | **r = 0.371**** |
| Practice | 40.75 | 1.51 | **p = 0.001 , S** |

**p<0.01, S – Significant

The above table 4.8 shows the relationship between post-test knowledge and practice score regarding coronary angiogram care among staff nurses

The findings revealed that the post-test mean knowledge score was 26.93 with the S.D of 1.89 and post-test mean practice score was 40.75 with the S.D of 1.51. The calculated 'r' test value r = 0.371 showed a moderate positive correlation between post-test knowledge and practice score which was found to be statistically significant at p<0.01.

The study findings showed that when the knowledge of staff nurses regarding coronary angiogram increases their practice level also increases.

**SECTION D: ASSESSMENT OF EFFECTIVENESS OF PLANNED EDUCATIONAL PROGRAMME ON LEVEL OF KNOWLEDGE AND PRACTICE REGARDING CORONARY ANGIOGRAM CARE AMONG THE STAFF NURSES.**

**Table 4.9: Comparison of pre-test and post-test level of knowledge regarding coronary angiogram care among staff nurses**

**N = 60**

| Knowledge | Mean | S.D | Paired 't' Test |
|---|---|---|---|
| Pre-test | 13.0 | 3.71 | **t = 28.758*** ** |
| Post-test | 26.98 | 1.89 | **p = 0.000 , S** |

***p 0.001, S – Significant

The above table 4.9 shows the comparison of pre-test and post-test level of knowledge regarding coronary angiogram care among staff nurses.

The findings revealed that the pre-test mean score of knowledge was 13.0 with the S.D of 3.71 whereas in the post-test the mean score of knowledge was 26.98 with S.D of 1.89. The calculated paired 't' test value of t = 28.758 which was found to be higher than the table value at $p<0.001$ which proved high level of statistical significance.

The study findings revealed that planned educational programme given to the staff nurses was effective and nurses had significant improvement in their level of knowledge regarding coronary angiogram care.

**Table 4.10: Comparison of pre-test and post-test level of practice regarding coronary angiogram care among staff nurses**

**N = 60**

| Practice | Mean | S.D | Paired 't' Test |
|---|---|---|---|
| Pre-test | 22.63 | 2.01 | **t = 57.933*** ** |
| Post -test | 40.75 | 1.51 | **p = 0.001 , S** |

***p<0.001, S – Significant

The above table 4.10 shows comparison of pre-test and post-test level of practice regarding coronary angiogram care among staff nurses

The findings revealed that the pre-test mean score of practice was 22.63 with the S.D of 2.01 whereas in the post- test the mean score of practice was 40.75 with the S.D 1.51. The calculated paired 't' test value t = 57.933 which was found to be higher than the table value at p<0.001 which proved high level of statistical significance.

The study findings revealed that planned educational programme given to the staff nurses was effective and nurses had significant improvement in their level of practice regarding coronary angiogram care.

**SECTION E: ASSESSMENT OF ASSOCIATION OF MEAN DIFFERED LEVEL OF KNOWLEDGE AND PRACTICE REGARDING CORONARY ANGIOGRAM CARE OF STAFF NURSES WITH THEIR SELECTED DEMOGRAPHIC VARIABLES**

**Table 4.11: Association of mean differed level of knowledge regarding coronary angiogram care among the staff nurses with their selected demographic variables**

**N = 60**

| Demographic Variables | Below Average | | Above Average | | Chi-Square Value |
|---|---|---|---|---|---|
| | N | % | N | % | |
| **Age in years** | | | | | $\chi^2 = 4.286$ d.f = 1 p = 0.038 S* |
| 21 – 23 | 26 | 43.3 | 30 | 50.0 | |
| 24 – 26 | 4 | 6.7 | 0 | | |
| 27 – 28 | - | - | - | - | |
| >28 | - | - | - | - | |
| **Gender** | | | | | - |
| Male | - | - | - | - | |
| Female | 30 | 50.0 | 30 | 50.0 | |
| **Educational Level** | | | | | $\chi^2 = 0.351$ d.f = 1 p = 0.554 N.S |
| General Nursing | 2 | 3.3 | 1 | 1.7 | |
| B.Sc. Nursing | 28 | 46.7 | 29 | 48.3 | |
| Post Basic Nursing | - | - | - | - | |
| **Total years of experience as a staff nurse** | | | | | $\chi^2 = 4.132$ d.f = 3 p = 0.248 N.S |
| 0 - 6 months | 23 | 38.4 | 24 | 40.0 | |
| 7 months - 1 year | 5 | 8.3 | 4 | 6.7 | |
| 1 - 11/2 years | 0 | 0 | 2 | 3.3 | |
| 11/2 - 2 years | 2 | 3.3 | 0 | 0 | |
| **Work experience in cardiac unit** | | | | | $\chi^2 = 3.683$ d.f = 2 p = 0.159 N.S |
| 0 - 6 months | 23 | 38.3 | 25 | 41.7 | |
| 7 months - 1 year | 7 | 11.7 | 3 | 5.0 | |
| 1 - 11/2 years | 0 | 0 | 2 | 3.3 | |
| 11/2 - 2 years | - | - | - | - | |
| **Have you attended any class on Coronary angiogram care** | | | | | $\chi^2 = 2.455$ d.f = 1 p = 0.117 N.S |
| Yes | 4 | 6.7 | 9 | 15.0 | |
| No | 26 | 43.3 | 21 | 35.0 | |

*p<0.05, S – Significant, N.S – Not Significant

The table 4.11 shows the association of mean differed level of knowledge regarding coronary angiogram care among the staff nurses with their selected demographic variables.

The findings revealed that there was a statistically significant association found between the mean differed level of knowledge and the demographic variable age **($\chi^2$ = 4.286)** at **p = 0.038**, there was no statistically significant association found with other demographic variables such as gender, educational level, total years of experience, experience in cardiac unit and previous exposure to coronary angiogram care class.

Findings revealed that young nurses gained more knowledge regarding coronary angiogram care.

**Table 4.12: Association of mean differed level of practice regarding coronary angiogram care among staff nurses with their selected demographic variables**

**N = 60**

| Demographic Variables | Below Average | | Above Average | | Chi-Square Value |
|---|---|---|---|---|---|
| | N | % | N | % | |
| **Age in years** | | | | | $\chi^2 = 0.587$ d.f = 1 p = 0.444 N.S |
| 21 – 23 | 31 | 51.7 | 25 | 41.7 | |
| 24 – 26 | 3 | 5.0 | 1 | 1.7 | |
| 27 – 28 | - | - | - | - | |
| >28 | - | - | - | - | |
| **Gender** | | | | | - |
| Male | - | - | - | - | |
| Female | 34 | 56.7 | 26 | 43.3 | |
| **Educational Level** | | | | | $\chi^2 = 0.129$ d.f = 1 p = 0.720 N.S |
| General Nursing | 2 | 3.3 | 1 | 1.7 | |
| B.Sc. Nursing | 32 | 53.3 | 25 | 41.7 | |
| Post Basic Nursing | - | - | - | - | |
| **Total years of experience as a staff nurse** | | | | | $\chi^2 = 0.782$ d.f = 3 p = 0.854 N.S |
| 0 - 6 months | 24 | 46.6 | 19 | 31.7 | |
| 7 months - 1 year | 8 | 6.6 | 5 | 8.3 | |
| 1 - 11/2 years | 1 | 1.7 | 1 | 1.7 | |
| 11/2 - 2 years | 1 | 1.7 | 1 | 1.7 | |
| **Work experience in cardiac unit** | | | | | $\chi^2 = 1.442$ d.f = 2 p = 0.486 N.S |
| 0 - 6 months | 29 | 48.3 | 19 | 31.6 | |
| 7 months - 1 year | 4 | 6.7 | 6 | 10.0 | |
| 1 - 11/2 years | 1 | 1.7 | 1 | 1.7 | |
| 11/2 - 2 years | - | - | - | - | |
| **Have you attended any class on Coronary angiogram care** | | | | | $\chi^2 = 1.067$ d.f = 1 p = 0.302 N.S |
| Yes | 9 | 15.0 | 4 | 6.6 | |
| No | 25 | 41.7 | 22 | 36.7 | |

N.S – Not Significant

The table 4.12 shows the association of mean differed level of practice regarding coronary angiogram care among staff nurses with their selected demographic variables.

The findings revealed that there was no statistical significant association found between the mean differed level of practice and demographic variables such as age, gender, educational level, total years of experience, experience in cardiac unit and previous exposure to coronary angiogram care class.

# *DISCUSSION*

# CHAPTER – 5

## DISCUSSION

The aim of the study was to assess the effectiveness of planned educational program on coronary angiogram care among the staff nurses working in cardiac unit in a view to develop a protocol for coronary angiogram care. The findings of the study were discussed based on the objectives.

**Distribution of demographic variable**

The selected demographic variables of the study were age, gender, educational level, total years of experience and staff nurse, work experience in cardiac unit and attendance at any class on coronary angiogram care. With regard to age in years, majority 56(93.33%) of the samples were in age group of 21 – 23 years, and only 4(6.67%) of them were in the age group of 24 – 26 years and none of the samples falls in the age group of 27 – 28 and more than 28 years. With respect to gender all 60(100%) of the samples were females. Regarding the educational level, majority 57(95%) of the samples were educated up to B.Sc. Nursing, and a few 3(5%) were general nursing and none of the samples fall under post basic nursing category.

Considering the total years of the experience mostly 47(78.34%) of the samples had 0 – 6 months of experience as staff nurse and 9(15%) of the samples had 7 months to 1 year of experience. Regarding work experience in cardiac unit 48(80%) of the sample had work experience of 0 – 6 months and 10(16.67%) of the sample had 7 months to 1 year of experience. Most of the 47(78.33%) of the samples had not attended any class on coronary angiogram care.

The study findings revealed that majority of the samples were young female nurses with B.Sc. Nursing qualification. And they had nearly 6 months of experience and many of them had not attended any classes on coronary angiogram care previously.

**The first objective was to assess the pre and post-test level of knowledge and practice of the staff nurses regarding coronary angiogram care.**

The overall pre-test level of knowledge revealed that many 39(65%) needs improvement and 21(35%) had moderately adequate knowledge regarding coronary angiogram care, and none of the samples falls under the category of adequate knowledge. The mean score of pre-test knowledge was found to be 13.0 with S.D of 3.71. The overall post-test level of knowledge revealed that majority 59(98.33%) had adequate knowledge and 1(1.67%) had moderately adequate knowledge regarding coronary angiogram care and the mean score of post-test was found to be 26.98 with S.D of 1.89.

Considering the practice the overall pre-test level of practice revealed that 30(50%) had fair practice and 30 (50%) needs improvement and none of the samples had good practice regarding coronary angiogram care and the mean score of pre-test practice was found to be 22.63 with S.D of 2.01. The overall post-test level of practice revealed that all 60(100%) had good practice regarding coronary angiogram care with a mean score of 40.75 with S.D of 1.51.

The findings of the study was supported by the following study,

**East & Jacoby (2005)** explored a study to assess the effectiveness of nursing staff education program on compliance with central line care policy in the cardiac intensive care unit. The aim of the study was to demonstrate the effectiveness of education program for staff nurses regarding central line policy. A quasi-experimental pre and post-test design was used in the study with a sample size of 47 staff nurses. After pre-test, a self-learning module was given for the nurses and followed by conduction of post-test. Pre and post test results were used to analyse the effectiveness of the educational module and the results showed a remarkable improvement in the compliance policy ($p<0.0001$).

**The second objective was to correlate the post-test knowledge and practice of the staff nurses regarding coronary angiogram care.**

The findings revealed that the post-test mean knowledge score was 26.93 with the S.D of 1.89 and post-test mean practice score was 40.75 with the S.D of 1.51. The calculated ‘r’ test value $r = 0.371$ showed a moderate positive correlation between post-

test knowledge and practice score which was found to be statistically significant at $p<0.001$.

The study findings showed that when the knowledge of staff nurses regarding coronary angiogram increases their practice level also increases.

So the first null hypothesis stated that **"There is no significant relationship between the post-test knowledge and practice of staff nurses regarding coronary angiogram care."** was not accepted.

The findings of the study was supported by the following study,

**Arathy (2011**) had done a study to assess the knowledge and practices among cardiac nurses about patient's safety after cardiac catheterization .The study was done by conducting a survey with a sample size of 30 using a questionnaire and an observational tool. The study findings revealed that the knowledge level is more in staff nurses who have more than five years of experience ($p=0.015$)

**The third objective was to assess the effectiveness of planned educational program on knowledge and practice of the staff nurses regarding coronary angiogram care.**

The findings revealed that the pre-test mean score of knowledge was 13.0 with S.D of 3.71 whereas in the post test the mean score of knowledge was 26.98 with S.D of 1.89. The calculated paired 't' test value of $t = 28.758$ was found to be statistically significant than the table value at $p<0.001$

The study findings revealed that planned educational programme given to the staff nurses was effective and nurses had significant improvement in their level of knowledge regarding coronary angiogram care.

So the second null hypothesis stated that **"There is no significant difference in pre and post-test level of knowledge and practice of staff nurses regarding coronary angiogram care"** was not accepted.

The findings of the study was supported by the following study,

**Stacy (2011**) conducted a study to create a self-learning module for nurse those who care for patients undergoing angioplasty and receiving anticoagulation therapy. The aim of the study was to formulate a self-learning module for the nurses. The design adopted for the study was pre experimental one group pre-test and post-test design with a sample size of 24. Pre-test was done followed by self-learning module was introduced to the staff nurses and evaluated the post-test knowledge. The study findings revealed that self-learning module enhance the knowledge of the staff nurse and improves patient safety.

**The fourth objective was to associate the mean differed level of knowledge and practice of the staff nurses with their selected demographic variables**.

The findings revealed that there was statistically significant association found between the mean differed level of knowledge and the demographic variable age **($\chi^2$ = 4.286)** at (p = 0.038), there was no statistically significant association found with other demographic variables such as gender, educational level, total years of experience, experience in cardiac unit and previous exposure to coronary angiogram care class.

Findings revealed that young nurses gained more knowledge regarding coronary angiogram care.

So the third null hypothesis stated that "**There is no significant association of mean differed level of knowledge and practice with selected demographic variables of the staff nurses"** was not accepted for the data age and accepted for other demographic variables.

The findings revealed that there was no statistically significant association found between the mean differed levels of practice and the demographic variables such as age, gender, educational level, total years of experience, experience in cardiac unit and attendance at coronary angiogram care class.

So the third null hypothesis stated that **"There is no significant association of mean differed level of knowledge and practice of the staff nurses with their selected demographic variables**" was accepted.

The findings of the study was supported with the following study,

**Burns & Shively (1996)** conducted a study to evaluate the critical care nurses knowledge on pulmonary artery catheters using a multiple choice questionnaire consisting of 31 items and 14 demographic questions, with a sample size of critical care nurses. The demographic questions include critical care nursing experience, educational back ground, work area, and frequency of pulmonary catheter use. The studies revealed that mean knowledge score was 16.4 with S.D of 3.74 and the range of correct score was 8 to 25. The study concluded that knowledge on pulmonary artery catheters is directly related to the frequency of their exposure to it and their experience and attendance at a pulmonary artery catheter class.

# *SUMMARY,*

# *CONCLUSION,*

# *IMPLICATION,*

# *RECOMMENDATION*

# *AND LIMITATION*

# CHAPTER – 6

## SUMMARY, CONCLUSION, IMPLICATION, RECOMMENDATION AND LIMITATION

This chapter deals with summary, conclusion, implication, recommendation and limitation.

### 6.1 SUMMARY

Identification and management of coronary artery disease and cardiovascular disease is an important aspect of providing comprehensive medical care. Coronary angioplasty has revolutionized the treatment of ischemic heart disease over the past 20 years. Coronary angiogram is now a gold standard in diagnosing coronary artery disease. The purpose of coronary angiography is to visualize the coronary arteries and the degree of obstructions of the coronary arteries. Complication rates of percutaneous coronary interventions are low but neither negligible nor irreducible. The complication of coronary angiogram includes hematoma formation, pseudo aneurysm, nephropathy, bacteraemia etc. The nurses play a major role in providing care to the patients in all phases of coronary angiogram including pre intra and post period. The enhancement of knowledge and practice regarding coronary angiogram care is essential in preventing complications.

The planned educational program focuses on enhancing the knowledge and practice of staff nurses regarding coronary angiogram care during the pre and the post procedural period.

The statement of the problem was **"A pre-experimental study to assess the effectiveness of planned educational program on the knowledge and practice regarding coronary angiogram care among staff nurses at a selected hospital in Chennai."**

**The objectives of the study were:**

1. To assess the pre and post-test level of knowledge and practice of the staff nurses regarding coronary angiogram care.
2. To correlate the post-test knowledge and practice of the staff nurses regarding coronary angiogram care.
3. To assess the effectiveness of planned educational program on knowledge and practice of the staff nurses regarding coronary angiogram care.
4. To associate the mean differed level of knowledge and practice of the staff nurses with their selected demographic variables.

**The null hypotheses formulated were:**

**$NH_1$:** There is no significant relationship between the post-test knowledge and practice of staff nurses regarding coronary angiogram care.

**$NH_2$:** There is no significant difference in pre and post-test level of knowledge and practice of staff nurses regarding coronary angiogram care.

**$NH_3$:** There is no significant association of mean differed level of knowledge and practice of the staff nurses with their selected demographic variables.

**The assumption of the study were**

1. The patient undergoing coronary angiogram is prone to develop complications.
2. Staff nurses need adequate information on coronary angiogram care
3. Planned educational program enriches the knowledge of staff nurses and which help them to practice better coronary angiogram care.
4. Protocol guides the nurses to perform standard care and helps to omit errors.

An extensive review of literature was done on several aspects coronary angiogram including knowledge, practice and complications. The conceptual framework was developed based on Imogene king's goal attainment theory.

**The research methodology of the study was:**

The research approach used in the study was quantitative approach using pre-experimental one group pre-test and post-test research design. Sixty samples were selected based on sample selection criteria using non probability purposive sampling technique. The study was conducted in MMM hospital, Chennai. The pilot study was

conducted in MMM hospital after obtaining ethical clearance from the ethical committee of the institution with six staff nurses working in cardiac unit which is located in separate block to assess the feasibility and practicability of the study. The tools used for data collection was a structured questionnaire to assess the knowledge level and an observational check list to assess the practice level of staff nurses on coronary angiogram care. The data was collected in three phases.

In the initial or pre-assessment phase a good rapport was established with the staff nurses and the knowledge was assessed using a self-administered questionnaire consisting of 30 questions and each of them took 15 to 20 minutes to complete the questionnaire. In the phase II, the staff nurses who completed the pre-test were given a planned educational program in groups using power point presentation and each session lasted for 1 ½ hours. The program covered the general aspect of coronary angiogram, its indications, contraindications, pre-procedural care, post-procedural care and complications. In phase III, a post test was conducted after 7 days from the day of planned educational program with the same self-administered questionnaire and observational check list for the same group in same manner which was followed in pre-test. The data was analysed using descriptive and inferential statistics.

**The major findings of the study were:**

The findings related to demographic variables revealed that majority of the samples were young female nurses with B.Sc. nursing qualification and they had nearly 6 months of experience and many of them have not attended any class on coronary angiogram previously. The overall pre-test level of knowledge revealed that many 39(65%) needs improvement and 21(35%) had moderately adequate knowledge regarding coronary angiogram care, and none of the samples falls under the category of adequate knowledge. The overall post-test level of knowledge revealed that majority 59(98.33%) had adequate knowledge and 1(1.67%) had moderately adequate knowledge regarding coronary angiogram care.

The overall pre-test level of practice revealed that 30(50%) had fair practice and 30(50%) needs improvement and none of the samples had good practice regarding coronary angiogram care. The overall post-test level of practice revealed that all

60(100%) had good practice regarding coronary angiogram care and none of them had poor practice.

The findings revealed that the post-test mean knowledge score was 26.93 with the S.D of 1.89 and post-test mean practice score was 40.75 with the S.D of 1.51. The calculated 'r' test value r = 0.371 showed a moderate positive correlation between post-test knowledge and practice score which was found to be statistically significant at $p<0.001$.

The findings also revealed that the pre-test mean score of knowledge was 13.0 with S.D of 3.71 whereas in the post test the mean score of knowledge was 26.98 with S.D of 1.89. The calculated paired 't' test value t = 28.758 found to be statistically significant at $p<0.001$. The findings revealed that the pre-test mean score of practice was 22.63 with S.D of 2.01 whereas in the post test the mean score of practice was 40.75 with S.D 1.51. The calculated paired 't' test value t = 57.933 was found to be statistically significant at $p<0.001$.

The findings revealed that there was statistical significance between the mean differed level of knowledge and the demographic variable **age ($\chi^2 = 4.286$) at p = 0.038**, there was no statistically significant association found with other demographic variables such as gender, educational level, total years of experience, experience in cardiac unit and previous exposure to coronary angiogram care class. The findings revealed that there was no statistically significant association found between the mean differed level of practice and demographic variables such as age, gender, educational level, total years of experience, experience in cardiac unit and previous exposure to coronary angiogram care class.

## 6.2 CONCLUSION

The study concluded that the planned educational program was effective in improving the knowledge and practice of staff nurses. It helps them to be more confident in their duty and to omit errors.

## 6.3 NURSING IMPLICATION

The implication of the study can be seen in the area of nursing practice, nursing service and nursing research.

### 6.3.1 Nursing Practice

1. The study improves the follow-up and collaborative services of both hospital and community health team.
2. Nurses can able to perform their duty without any errors.
3. Nurses can impart knowledge to the patients regarding coronary angiogram care.
4. The practical skills of the nurses can be assessed using the checklist.

### 6.3.2 Nursing Education

1. This study will help the student nurses to understand the importance of coronary angiogram care.
2. The practical skills regarding the care of patients undergoing coronary angiogram care can be improved.
3. The knowledge of student nurses regarding coronary angiogram care canbe enhanced.

### 6.3.3 Nursing Research

1. The present study will help the future nursing researcher to carry out further study.
2. This study motivates other investigator to conduct further study on the same topic but in different settings.

### 6.3.4 Nursing Administration

1. These findings will help the administrator to publish the protocol in cardiac wards.
2. It helps them to create adequate learning materials for the staff nurses.
3. This helps to assess the practical skill of the staff nurses working in cardiac unit.
4. The nurse administrator can arrange continuing nursing education on coronary angiogram care.

## 6.4 RECOMMENDATION

1. The study can be replicated with much more sample.
2. The study can be conducted including all percutaneous coronary intervention procedures.
3. The effect of the educational program can be evaluated on a long term basis.
4. The study can be conducted even in the ICU settings

## 6.5 LIMITATION

1. The nurse researcher could not concentrate on the intra operative care during coronary angiogram care.

## 6.6 COMMUNICATION OF FINDINGS

The researcher is planning to communicate the findings either by a paper presentation or to publish the findings in an indexed journal so that the result can be generalized to all staff nurse working in the cardiac unit.

## 6.7 UTILIZATION OF THE RESEARCH FINDINGS

The findings are going to be utilized in the cardiac unit of MMM hospital by preparing a protocol consisting of the steps to be followed by the staff nurses in preparing the patients during the pre- procedural period and care to be followed in the post procedural period of coronary angiogram. The researcher feels that protocol will help the nurses to omit errors and can prevent complication during the phases of coronary angiogram care.

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# *APPENDICES*

# APPENDIX – A

MMM COLLEGE OF NURSING
Learn to Serve
A Unit of
The Madras Medical Mission

**MMMCON/R.S/01/2014** **28th October 2014**

To

Dr. Ajit Mullasari

Director – Cardiology

Madras Medical Mission

Chennai-37

**Respected Sir,**

**Greetings from MMM College of Nursing!**

**Sub:** Requesting for permission to conduct study among staff nurses-reg.,

This is to your kind notice that **Ms. Julin K. Thomas**, is a bonafide student of MSc(N) IInd year of MMM College of Nursing. I kindly request you to permit her to conduct the study on **"Effectiveness of planned educational programme on coronary angiogram care".** I assure that her study will not provide any risk to study subjects and she will be abide to the rules & regulations of the hospital and the hospital activities will not be affected. Kindly consider the same and do the needful.

**Note:**

1. The above study was approved by ethical committee of The Madras Medical Mission Hospital

Thanking You

PRINCIPAL
MMM COLLEGE OF NURSING
No. 131, SAKTHI NAGAR,
NOLAMBUR,
CHENNAI - 600 095.

**Copy to:**

i. The Director Medical Administration

ii. The Director Administration

iii. The Nursing Superintendent

Dr. MULLASARI S. AJIT
Director - Cardiology
Institute of Cardio - Vascular Diseases
Madras Medical Mission
Chennai - 600 037.

**MMM College of Nursing**
No. 131, Sakthi Nagar, Nolambur
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**Registered Office :**
**The Madras Medical Mission**
No. 4A, Dr. J.J. Nagar, Mogappair,
Chennai - 600 037
Phone: 044-26565961, 26565991, 26561801.

# APPENDIX – B


**INSTITUTIONAL ETHICS COMMITTEE**
**THE MADRAS MEDICAL MISSION**
No. 4-A, Dr. J.J. NAGAR, MOGAPPAIR, CHENNAI - 600 037, INDIA
Call : + 91 - 44 - 26561801, 26565961, 26565991 Fax : 91 - 44 - 26565859
E-mail : icvddoctors@mmm.org.in Website : http://www.mmm.org.in


**To**

**Date:** 12 Jun 2015

**Mrs. Julin K Thomas**
**Madras Medical Mission,**
**Chennai 600037**

**EC Reg no: ECR/140/Inst/TN/2013**

**Ref:** Effectiveness of planned educational program on the knowledge and practice regarding Coronary Angiogram care among nurses

**Sub: Ethics Committee approval of study document for the above mentioned study.**

**Dear** Mrs. Julin K Thomas

We have received from you 06+1 copies of each of following study related document submitted vide letter dated: 18 Jul 2014

1. Protocol Synopsis
2. Informed Consent Form

Upon submission of the validation certificate as requested by EC, the committee has decided to approve the above-mentioned document after due consideration in the meeting held on 23rd May 2015

The following members were present at the meeting held on 23 May 2015 at 9-30 AM at Mount Tabour Lounge, Madras Medical Mission.

| Name & Qualification | Primary Scientific or Non scientific Specialty | Affiliation with the institution | Gender |
|---|---|---|---|
| Dr. M.S. Ramachandran, MBBS,MD,FRCP,FICP,DSC(HONS), Prof.Director medicine(Rtd) | Chairperson | No | M |
| Dr V M Kurian, MS, MCh, DPMR. Sr. Consultant cardiovascular Surgeon Madras Medical Mission | Member secretary | Yes | M |
| Dr Ajit Mullasari, MD DNB DM, Director of cardiology, Madras Medical Mission | Member Clinician | Yes | M |

# INSTITUTIONAL ETHICS COMMITTEE
## THE MADRAS MEDICAL MISSION
No. 4-A, Dr. J.J. NAGAR, MOGAPPAIR, CHENNAI - 600 037, INDIA
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E-mail : icvddoctors@mmm.org.in Website : http://www.mmm.org.in


| | | | |
|---|---|---|---|
| Dr. Saravanan Sundararaj Director ILKOT, Madras Medical Mission. MBBS,FRCS | Member, Clinician | Yes | M |
| Dr. K.M Kundavi, MBBS., D.G.O.DNB.(OG) MNAMS, Senior Consultant, IRM, Madras Medical Mission | Member, Clinician | Yes | F |
| Dr. Suma Malini Victor, MBBS, DNB., Consultant Cardiologist, Madras Medical Mission | Member, Clinician | Yes | F |
| Dr. Chitrasree V, MBBS,DCP Coordinator, Consultant Lab services, Madras Medical Mission | Member, Basic Medical Scientist | Yes | F |
| Rev.Fr. Ninan Chacko, MA,DPS, Chaplain Theologist, ICVD, Madras Medical Mission | Non-Clinical Member Theologist/Layperson | Yes | M |
| Mr. Ravi Kumar Paul, LLB Paul & Paul B.A., B.L., Advocates Chennai. | Member Legal Expert | No | M |
| Dr. C.B Tharani, M.D. Pharmacology | Pharmacologist | No | F |
| Dr. Philomina Mariados, PhD(Sociology), Dean, College of Health Science, Madras Medical Mission | Member, Lay person | Yes | F |

The Committee expects from the Principal Investigator to report the study on annual basis.

It was to be noted that neither you nor any of your proposed study team members were present during the decision-making procedures of the Ethics Committee.

Yours truly,

**Signature:** _____ **Date:** 12/06/2025

**Name: Dr V M Kurian**
**Title: Member secretary**

MEMBER SECRETARY
INSTITUITIONAL ETHICS COMMITTEE
MADRAS MEDICAL MISSION
No. 4 - A, Dr [illegible] NAGAR
MOGAPPAIR, CHENNAI - 600 037.

**APPENDIX-C**

# INFORMED CONSENT FORM

I here with give my consent to participate in the study conducted by **Mrs.Julin K Thomas**, M.Sc. nursing student of MMM college of nursing on "**A pre-experimental study to assess the effectiveness of planned educational program on the knowledge and practice regarding coronary angiogram care among staff nurses at a selected hospital in Chennai."**

**Thanking You,**

**Date :** **Signature of the Respondent:**

**Place :**

**APPENDIX – D**

# TOOL FOR DATA COLLECTION

**PART 1- DEMOGRAPHIC DATA**

**SAMPLE NUMBER:**

1. AGE IN YEARS

    1.1 22-24

    1.2 25-26

    1.3 27-28

    1.4 >28

2. GENDER

    2.1 Male

    2.2 Female

3. EDUCATIONAL LEVEL

    3.1 General nursing

    3.2 B.Sc Nursing

    3.3 Post Basic Nursing

4. TOTAL YEARS OF EXPERIENCE AS A STAFF NURSE:

    4.1 0-6 Months

    4.2 7-1 Years

    4.3 1-1 ½ Years

    4.4 1 ½ -2 Years

5. WORK EXPERIENCE IN CARDIAC UNIT:

    5.1 0-6 Months

    5.2 7-1 Years

    5.3 1-1 ½ Years

    5.4 1 ½ -2 Years

6. HAVE YOU ATTENDED ANY CLASS ON CORONARY ANGIOGRAM CARE:

    6.1 Yes

    6.2 No

**PART–II: SELF ADMINISTERED QUESTIONNAIRE TO ASSESS KNOWLEDGE ON CORONARY ANGIOGRAM CARE**

(Kindly go through each question, choose the best answer and place a tick mark on the space provided. Each question carries a score of one)

**GENERAL ASPECT:**

1. The heart is supplied with.
    a. Renal artery
    b. Coronary artery
    c. Carotid artery
    d. Iliac artery

2. Which are the branches of left main coronary artery?
    a. Circumflex and left anterior descending artery
    b. Left anterior descending and Posterior descending artery
    c. Circumflex and Posterior descending artery
    d. Left anterior descending and AV nodal artery

3. Which is the branch of circumflex artery?
    a. Diagonals
    b. Septals
    c. Obtuse marginals
    d. Ramus intermedias

4. Which artery supplies the posterior side of the heart?
    a. Left anterior descending artery
    b. Circumflex artery
    c. Ramus intermedias
    d. Right coronary artery

**CORONARY ANGIOGRAM:**

5. Which is the technique used to enlarge the internal diameter of a diseased vessel by applying balloon pressure to an area of atherosclerotic stenosis?
    a. Coronary angiogram
    b. Right heart catheterization
    c. Balloon angioplasty
    d. Intra-aortic balloon pump

6. Where does the catheter reach when inserted through radial or femoral artery during coronary angiogram?
    a. Left atrium
    b. Aortic root
    c. Right ventricle
    d. Right atrium

7. The indication for doing coronary angiogram includes
    a. Coronary artery disease
    b. Cardiomyopathy
    c. Rheumatic heart disease
    d. Cardiac arrhythmia

8. Which is the contraindication for doing coronary angiogram?
    a. Myocardial infarction.
    b. Coronary artery disease.
    c. Renal failure.
    d. Valvular heart disease

**PREPROCEDURAL CARE:**

9. What is the purpose of Allen's test?
    a. To assess the quality of pulse
    b. To assess the patency of radial artery
    c. To assess the communication of ulnar and radial artery
    d. To assess the patency of ulnar artery

10. What do quality of pulse 2+ indicate ?

a. Feeble pulse
b. Normal pulse
c. Strong pulse
d. Bounding pulse

11. What is the formula for calculating creatinine clearance in females?

a. (140-age) × wt × 0.72\ 72 × creatinine
b. (140-age) × wt/ 72 × creatinine
c. (140-age) × wt / 72 × creatinine × 0.85
d. (140- age) × wt / 0.85 × 72 × creatinine

12. How many hours client should be off heparin before coronary angiogram?

a. 2 hrs
b. 4 hrs
c. 6 hrs
d. 8 hrs

13. How long should the patient be in NPO status for coronary angiogram?

a. 1 - 2 hrs
b. 3 - 4 hrs
c. 6 – 8 hrs
d. 12 – 24 hrs

14. What is the reason for skipping anti diabetic medication at the day of procedure?

a. To prevent hypotension
b. To prevent hypoglycemia
c. To prevent arrhythmia
d. To prevent hyperglycemia

15. Which is the drug of choice in vasovagal reactions?

a. Isoprenaline
b. Adrenaline

c. Nor adrenaline
d. Atropine

16. Which of the following are the clinical features of vasovagal reaction?
    a. Hypotension, bradycardia, diaphoresis
    b. Chest pain, hypotension, palpitation
    c. Flushing, palpitation, itching
    d. Dyspnea, giddiness, palpitation

17. Why a combination of Inj. NTG and Inj. Dilzem is administered through the sheath during Cardiac Catheterization?
    a. Increase cardiac output
    b. Prevents bradycardia
    c. Prevents arterial spasm
    d. Prevents vasovagal attack

18. Why is a client instructed to cough during coronary angiogram?
    a. To prevent transient bradycardia
    b. To reduce flushing sensation
    c. To reduce blood pressure
    d. To reduce anxiety

19. When does a client develop a flushed and nauseated sensation during coronary angiogram?
    a. Application of antiseptic solution
    b. Injection of contrast
    c. Insertion of catheter
    d. Removal of catheter

**POST PROCEDURAL:**

20. How frequently must a nurse assess the vital signs, distal pulses and access site during immediate post coronary angiogram period?
    a. Every 15 minutes for first 1 hour
    b. Every 15 minutes for first 2 hours

c. Every 15 minutes for the first3 hours
d. Every 15 minutes for the first 4 hours

21. Which is the permitted degree of head elevation in a client following femoral puncture?
    a. <45 degrees
    b. < 15 degrees
    c. < 30 degrees
    d. < 60 degrees

22. When can a client following femoral puncture be ambulated?
    a. After 2 hours
    b. After 3 hours
    c. After 6 hours
    d. After 8 hours

23. Which of the following urine output measurements indicates contrast induced renal failure in the post coronary angiogram period?
    a. Less than 45ml/hr
    b. Less than 30ml/hr
    c. Less than 15ml/hr
    d. Less than 60ml/hr

24. Which position has to be provided to a client during vaso vagal reaction?
    a. Trendelenburg
    b. Reverse trendelenburg
    c. Left lateral
    d. Fowler's

25. How long is a client after radial artery catheterization advised not to strain or lift anything greater than 10 kg?
    a. First 12 hours
    b. 24 hours
    c. 48- 72 hours
    d. A week

26. When is a client permitted to drive after radial catheterization?
    a. After 1 hour
    b. After 4 hours
    c. After 8 hours
    d. After 24 hours

**COMPLICATION**

27. Hardened area in the femoral region associated with pain in a client following coronary angiogram indicates?
    a. Hematoma
    b. Retroperitoneal hemorrhage
    c. Pseudo aneurysm
    d. Arteriovenous fistula

28. What is antidote of Inj. Heparin in case of vessel perforation?
    a. Warfarin
    b. Vitamin K
    c. Protamine sulphate
    d. Glycoprotein IIb/ IIIa receptor inhibitor

29. Which manifestation occurs in smooth muscle due to contrast hypersensitivity?
    a. Pruritus
    b. Hypotension
    c. Bronchospasm
    d. Arrhythmia.

30. What is the drug of choice for client with elevated Renal Function Test to prevent contrast induced kidney injury?
    a. Furosemide
    b. Sodium bicarbonate
    c. Spironolactone
    d. N- acetyl cysteine

**PART-III: OBSERVATIONAL CHECKLIST TO ASSESS THE PRACTICE ON CORONARY ANGIOGRAM CARE**

**Part III (a) – Pre-procedural care checklist**

| S.NO. | ITEMS | YES | NO |
|---|---|---|---|
| 1. | Collects the previous medical and surgical history. | | |
| 2. | Asks the client about allergies and make a note of it. | | |
| 3. | Social history regarding smoking and alcohol | | |
| 4. | Assess and records vital signs | | |
| 5. | Assess the patient's ability to do activities of daily living | | |
| 6. | Checks the quality of pulse and records it*<br>- Posterior tibial<br>- Dorsalis pedis<br>- Radial<br>- Femoral | | |
| 7. | Monitors weight &height and records the same | | |
| 8. | Checks whether report collected or not? | | |
| 9. | Checks whether all the documents (Previous medical report, Informed consent, anesthesia and sedation, blood and blood) are available. | | |
| 10. | Performs skin shaving and sterile preparation | | |
| 11. | Removal of accessories and ornaments and handover to relatives | | |
| 12. | Confirms that client empties bladder before shifting. | | |
| 13. | Assesses the anxiety level and provide therapeutic touch. | | |
| 14. | Maintains good rapport with patient | | |
| 15. | Clarifies all doubts and reassures the patient | | |
| 16. | Withholds anticoagulants. | | |
| 17. | Administration of premedication. | | |
| 18. | Checks whether patient is in NPO status for 4-6 hrs. | | |
| 19. | Maintains intake output chart. | | |
| 20. | Explain the patient and relatives regarding need for deep breathing and NPO status. | | |

| S.NO. | ITEMS | YES | NO |
|---|---|---|---|
| 21. | Explains patient and relatives the duration of procedure and length of waiting time on the day of procedure. | | |
| 22. | Explain to client the length of bed rest needed and its importance. | | |
| 23. | Shifts the patient on call. | | |
| 24. | Arranges the stretcher prior to shift the patient to Cathlab. | | |
| 25. | Hand over the client to Cathlab staff along with essential documents and records it along with the in time. | | |

**NOTE:**

* If the nurse performs all the sub items a "✓" will be put in YES column and it carries 1 mark.

**Part III (b) – Post-procedural care checklist**

| S.NO. | ITEMS | YES | NO |
|---|---|---|---|
| 1. | Receives patient and records from Cathlab and record the same | | |
| 2. | Shift the patient using proper shifting technique. | | |
| 3. | Checks the conscious level and orientation level of patient and record the same | | |
| 4. | Checks whether all records are present. | | |
| 5. | Connects the patient to cardiac monitor. | | |
| 6. | Checks for the quality of pulse in the extremity in which the procedure has been done and record the same | | |
| 7. | Assess and record vital signs every*<br>i. 15 min for 1hr<br>ii. 30 min for 2hr<br>iii. 1 hr for 4hrs | | |
| 8. | Obtains post procedural ECG | | |
| 9. | Checks the procedure site for bleeding and hematoma<br>i. Every 15min for 1st1hr<br>ii. Every 30min for next2hr<br>iii. Every 1hr for 4hr and records the same. | | |
| 10. | Checks for the numbness of extremity and record the same. | | |
| 11. | Checks for cold and clammy extremity. | | |
| 12. | Assess the intensity of pain*<br>- Document the intensity of pain<br>- Inform doctor if any pain exists<br>- Carry out doctors order | | |
| 13. | Administers fluid and soft diet as per doctors order | | |
| 14. | Maintains intake output chart. | | |
| 15. | Encourages client to have high intake of fluid to wash out contrast. | | |
| 16. | Immobilize extremity for 4-6 hours. | | |
| 17. | Instruct patient and relatives to call immediately when feels discomfort | | |
| 18. | Ambulates the patient within 8 hours. | | |
| 19. | Educates the patient regarding (diet, activity, medicine and follow up) | | |

| S.NO. | ITEMS | YES | NO |
|---|---|---|---|
| | | | |
| 20. | Hand over the client and documents to the next shift staff and record it appropriately | | |

**NOTE:**

* If the nurse performs all the sub items a "✓" will be put in YES column and it carries 1 mark.

**ANSWER KEY**

| | | | |
|---|---|---|---|
| 1 | b | 16 | a |
| 2 | a | 17 | c |
| 3 | c | 18 | b |
| 4 | d | 19 | b |
| 5 | c | 20 | a |
| 6 | b | 21 | c |
| 7 | a | 22 | c |
| 8 | c | 23 | c |
| 9 | d | 24 | b |
| 10 | b | 25 | c |
| 11 | c | 26 | d |
| 12 | c | 27 | a |
| 13 | c | 28 | c |
| 14 | b | 29 | c |
| 15 | b | 30 | d |

**APPENDIX-E**

# Planned educational program

# on

# Coronary angiogram care

| | | |
|---|---|---|
| **Topic** | **:** | Coronary Angiogram Care |
| **Group** | **:** | Nurses working in Cardiac unit |
| **Place** | **:** | Madras medical Mission hospital, Mogappair, Chennai |
| **Teaching aid** | **:** | PowerPoint presentation |
| **Teaching method** | **:** | Lecture cum discussion |

**Central objective:**

At the end of the program the group will gain adequate knowledge, skill and attitude regarding coronary angiogram care.

**Specific objectives:**

At the end of the program the group will be able to,

i) enumeratethe structure of coronary artery.

ii) define coronary angiogram

iii) describe the coronary angiogram procedure

iv) list the indications of coronary angiogram

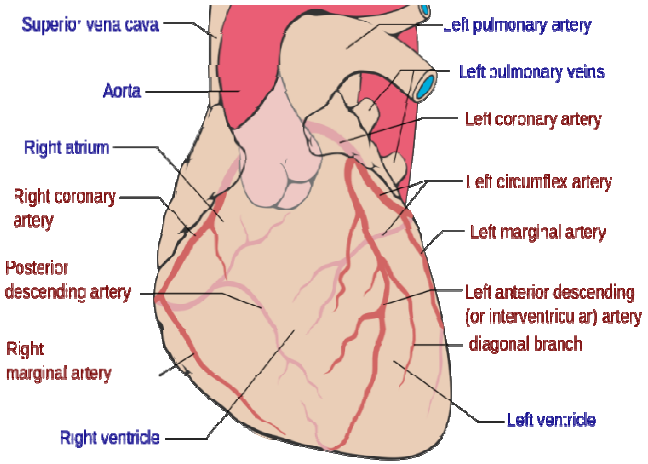
v) enlist the contra indication of coronary angiogram.

vi) explain the pre-procedural care during coronary angiogram

vii) brief the post-procedural care during coronary angiogram

viii) recognise the complications of coronary angiogram

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | 3 min | | **I.INTRODUCTION**<br>The heart is a hollow muscular organ encased in the pericardium. The heart plays a major function in the body that is circulation. Any disease to the heart can affect the circulation and should be diagnosed and treated in advance to prevent complications. Coronary arteries are the arteries supplying blood to the heart muscles and any obstruction to the coronary arteries due to the accumulation of atherosclerotic plaque resulted in coronary artery disease. "Coronary angiogram" is a gold standard in diagnosing coronary artery disease. It is a procedure to be done to find out the obstruction or malformation of the coronary arteries. Nurses have an important role in the pre catheterization and the post catheterization care in preventing complications. | | | | |
| 1 | 10 min | The group should be able to enumerate the structure of coronary | **II.ANATOMY OF CORONARY ARTERY**<br>Coronary artery supply blood to the heart muscles. Like all the other tissues in the body, the heart muscle need oxygen rich blood to function and oxygen depleted blood must be carried away. The coronary arteries run along the | Power point presentation | Lecture cum discussion Explaining, Clarifying doubts | Listening,<br>Asking doubts | Which are the branches of coronary arteries? |

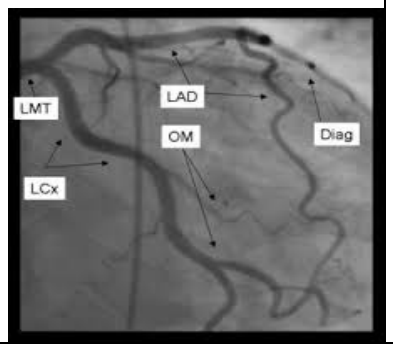
| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | arteries | outside of the heart and have small branches.<br>  <br><br>The two main coronary arteries are left and right main coronary arteries.<br><br>**LEFT MAIN CORONARY ARTERY**<br>The left main coronary artery supplies blood to left side of the heart muscle (left ventricle and left atrium). It divides into several branches. The left anterior descending artery (LAD)which branches off the left coronary artery and supplies blood to the front and left side of the heart. It | Power point presentation | Explaining Lecture cum discussion | Listening Taking notes | |

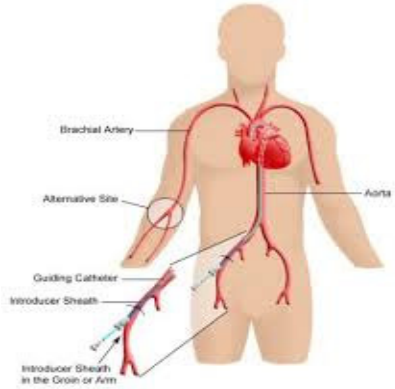
| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | supplies the portion of left and right ventricular myocardium and much of inter ventricular septum. The LAD appears to be a continuation of the left main coronary artery. It passes to the left of the pulmonic valve region courses in the anterior inter ventricular sulcus to the apex. The major branches of LAD consist of<br>• First diagonal branch<br>• First septal branch<br>• Right ventricular branch<br>• Minor septal branch<br>• Second diagonal branch<br>• Apical branch<br>The first diagonal branch is usually a large artery originate close to the bifurcation of left main coronary artery.<br>The first septal branch is first to exit the LAD at 90degree angle.<br>The second diagonal branch takes its origin 2/3 from origin to the termination of LAD. | | | | |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | The apical branchperfuse the anterior and diaphragmatic aspect of left ventricular free wall and apex. The others are minor septal branches.<br><br>The circumflex artery branches off the LAD and encircles the heart muscles and supply blood to outer side and back of the blood. It supply blood to the part of left atrium and left ventricle and major perfusion to Sino atrial (S.A) node and 10 % to Atrio ventricular (A.V) node. The branches include<br>• Atrial circumflex branch<br>• Sinus node artery<br>• Obtuse marginal branch<br>• Posterio lateral branch<br>The atrial circumflex branch runs along the left A.V groove perfusing left atrial wall.<br>Sinus node artery originates to the base of the superior venacava in the region of S.A node.<br>Obtuse marginal branch run along the ventricular wall laterally and posteriorly towards the apex. | | | | |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | Posterior lateral branch arise from the circumflex artery in 80 % of the cases and supply posterior and diaphragmatic wall of left ventricles.<br>The posterior descending arteries and A.V node arteries occasionally arise from circumflex artery.<br><br>**RIGHT MAIN CORONARY ARTERY**<br>It supplies the right atrium, right ventricle and a portion of posterior and inferior surface of the ventricle. It supplies the A.V node and Bundle of His. It originates behind the pulmonary artery coursing in the right A.V grooves laterally to the right margin of the heart and then posteriorly. The branches include<br>• Conus branch<br>• Sinus node artery<br>• Right ventricular branch<br>• Right atrial branch<br>• Acute marginal branch<br>• Av nodal branch<br>• Posterior descending branch | | | | |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | • Left ventricular branch<br>• left atrial branch<br>The conus branch supplies the upper part of the right ventricle. The sinus node artery supplies to sinus node and part of right atrium and left atrium. The right coronary artery supplies to right ventricular wall. The acute marginal branch perfuse inferior and diaphragmatic surface of the right ventricle. A.V nodal branch perfuse A.V node and portion of inter atrial septum.<br><br>The posterior descending branch supplies posterior of the inter-ventricular septum. The left ventricular branch perfuse diaphragmatic aspect of the left ventricle. The left atrium branches perfuse left atrium.<br><br>**CORONARY CAPILLARIES**<br>Blood passes from arteries into arterioles then into the capillaries where exchange of oxygen, carbon dioxide metabolic compounds and waste materials takes place. The heart has a dense capillaries and blood flow to meet the | | | | |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | myocardial metabolic needs.<br><br>**CORONARY VEINS**<br>The major veins feed into the great cardiac vein which run alongside the circumflex artery, becomes coronary sinus and empties into the right atrium. | | | | |
| 2 | 2 min | The group should be able to define coronary angiogram | **III.CORONARY ANGIOGRAM**<br>Cardiac catheterization is probably the greater technologic innovations provided to cardiologist. It is the gold standard procedure in diagnosing coronary artery disease "Caude Bernard" was the first to perform the procedure in 1844 and he is responsible for naming it cardiac catheterization. | Powerpoint presentation | Lecture cum discussion, explaining, clarifying doubts | Listening asking doubts | What is coronary angiogram? |
| 3 | 20 min | The group should be able to describe the coronary angiogram procedure | **STEPS OF CORONARY ANGIOGRAM PROCEDURE**<br>The procedure includes both steps and types of cardiac catheterization. Coronary angiography is a procedure that uses a special dye  | Power point presentation | Explaining, clarifying doubts | Listening, taking notes, asking doubts | What are the two types of cardiac catheterization? |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | (contrast material) and X-rays to see how blood flows through arteries of heart. It is often done along with cardiac catheterization. Coronary angiography is performed commonly by the percutaneous femoral approach or radial approach using polyurethane catheters to catheterize the right and left coronary arteries. The catheters are guided over a guide wire through distal aortic arch to the coronary sinus and thenthe guide wire is withdrawn and the catheter is filled with contrast material. Images are recorded to ensure that all coronary segments are seen.<br><br>The patient is asked to take a deep breath and hold it without bearing down, just before the injection of dye to clear the diaphragm from the field. After the injection the patient is told to breath and cough which helps to clear the contrast medium and their by reduce the flushing  | | | |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | sensation of the contrast medium.A combination of Inj. NTG and Inj. Dilzem is administered through the sheath during cardiac catheterization in order to prevent arterial spasm.<br>Imaging of the coronary arteries may also be performed after the administration of nitro-glycerine or other vasodilators to evaluate possible vasospasm effect on the coronary artery circulation, including coronary artery vessels.<br><br>Cardiac catheterization can be divide into two types namely<br>• Right heart catheterization<br>• Left heart catheterization<br><br>**Right heart catheterization**<br>A right heart catheterization is performed to determine how well the heart is pumping and to measure the pressures in the heart and lungs.In a right heart catheterization, the doctor guides a special catheter (a small, hollow tube) called a pulmonary artery (PA) catheter to the | Powerpoint Presentation | Explaining, clarifying doubts | Listening, taking notes, asking doubts | |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | right side of the heart and passes it into the pulmonary artery, the main artery carrying blood to the lungs. The doctor observes blood flow through the heart and measures the pressures inside the heart and in the lungs.<br><br>As the catheter is advanced toward the pulmonary artery, the doctor measures pressures along the way, inside the chambers on the right side of the heart—the right atrium and right ventricle. Indirect measurements of pressures on the left side of the heart are made, as well, by inflating a tiny balloon at the tip of the catheter once the catheter reaches the pulmonary artery. This pressure measurement is called the pulmonary artery occlusion pressure (PAOP), or pulmonary capillary "wedge" pressure (PCWP). The cardiac output—the amount of blood pumped by the heart per minute—is also determined during a right heart catheterization.<br><br>In some cases, IV heart medications are given during the right heart catheterization to see how the heart responds. For example, if the pressure is high in the pulmonary artery, | | | | |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | the doctor will give medications to dilate, or relax the blood vessels in the lungs and lower the pressures. Several pressure measurements will be done during the procedure to assess your body's response to the medications.<br><br>A right heart catheterization with biopsy may also be performed as part of the evaluation before a heart transplant. Pressures in the pulmonary (lung) circulation need to be as low as possible in order for a donor heart to work as well as possible. Excessive pressures will make it difficult for the new (donor) heart to pump effectively. A right heart catheterization will help to see if pulmonary pressures can be decreased with special medications (vasodilators) to ensure a successful transplant.<br><br>It is performed to assess and diagnose :<br>i. Heart failure<br>ii. Shock<br>iii. Valvular abnormalities<br>iv. Pulmonary hypertension<br>v. Atrial or Ventricular septal defect | | | | |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | vi. Congenital heart disease<br><br>**Left heart catheterization**<br>Left heart catheterization allows for direct intervention in cases of coronary artery occlusion. This technique is also used to assess the amount of occlusion (or blockage) in a coronary artery, often described as a percentage of occlusion. A thin, flexible wire is inserted into either the femoral artery or the radial artery and threaded toward the heart until it is in the ascending aorta. At this point, the wire can be directed into the coronary ostia and into the coronary arteries. A catheter is guided over the wire and enters either the left or right coronary artery. In this position, the interventional cardiologist can inject contrast and visualize the flow through the vessel. If necessary, the physician utilize percutaneous coronary intervention techniques, including the use of a stent (either bare-metal or drug-eluting) to open the blocked vessel and restore appropriate blood flow. In general, occlusions greater than 70% of the width of the vessel lumen are thought to require intervention. However, in cases where multiple vessels are | | | | |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | blocked (so called "three vessel disease"), the interventional cardiologist may opt instead to refer the patient to a cardiothoracic surgeon for coronary artery bypass graft (CABG).<br><br>It is performed to assess:<br>i) Coronary artery disease<br>ii) Coronary artery bypass graft patency<br>iii) Left ventricular Contractility<br>iv) Ejection fraction<br>v) Aortic and Mitral valve disease<br><br>**Angiography contrast agents:**<br>Iodinated contrast agents are either ionic or non-ionic acid. Contrast agents contain iodine which absorbs X rays, thus provides imaging properties. The hemodynamic and other side effects of contrast agents are related to their osmolarity. With coronary angiography, immediate side effects may include, sinus bradycardia, systemic arterial hypotension, arrhythmias, myocardial ischemia, T wave | | | | |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | changes in ECG.<br><br>Contrast agent act as an osmotic diuretics. The diuresis that occurs after catheterization may result in water and saline deficits with precipitate hypotension. For this reason patient should be on intravenous fluid replacement or be encouraged to drink liquids on return from catheterization lab. The procedure may last from 30 to 60 minutes. | | | | |
| 4 | 5 min | The group should be able to list the indications of coronary angiogram | **INDICATIONS OF CORONARY ANGIOGRAM**<br>Coronary artery disease<br>i) Stable pattern<br>a) Suspected coronary artery disease(CAD)<br>b) known CAD<br><br>ii) Unstable pattern<br>a) Acute coronary syndrome<br>b) Unstable angina<br>c) Non ST segment elevated myocardial infarction<br>d) ST segment elevated myocardial infraction<br>iii) Special considerations | Powerpoint presentation | Lecture cum discussion, explaining, motivating, clarifying doubts | Listening Taking notes, asking doubts | What are the indications of coronary angiogram? |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | a) Congestive cardiac failure<br>b) Preoperative assessment for non-cardiac surgery<br>c) structural or valvular heart disease<br>d) Aortic stenosis | | | | |
| 5 | 5 min | The group should be able to enlist the contra indication of coronary angiogram | **CONTRAINDICATIONS**<br>The contra indications of coronary angiogram includes,<br>1. Coagulopathy.<br>2. Renal failure.<br>3. Anemia.<br>4. Contrast allergy.<br>5. Active infection.<br>6. If patient is not willing. | Powerpoint presentation | Lecture cum discussion Clarifying doubts, explaining | Listening<br>Asking doubts | What are the contraindications of coronary angiogram? |
| 6 | 20 min | The group should be able to explain the pre-procedural care during coronary angiogram | **IV.PREPROCEDURAL CARE OFCORONARY ANGIOGRAM:**<br>Coronary angiography has evolved into outpatient procedure that has significant implications for nursing management and patient care. Nurses must be vigilant in identifying patients at risk, detecting problems and anticipating complications. Laboratory and other testing | Power point presentation | Lecture cum discussion | Listening | |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | should be done in advance<br><br>To ensure good outcome, proper planning, assessment and preparation are essential. Whether a patient comes in for pre admission or emergency case the paper work and laboratory work are same.<br><br>**Preparation of the patient**<br>• The patients' medical condition and overall health should be evaluated.<br>• Collect all the previous records including medical, surgical and medication history.<br>• Obtain a complete history of allergies, regarding history of shell fish allergy.<br>• History regarding smoking and alcohol should be obtained.<br>• Assess the patient's ability to do activities of daily living.<br>• Maintain good rapport with patient which makes the | | | | |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | patient to relieve their anxiety and promotes cooperation. Clarifies all doubts and reassures the patient.<br>• Verify whether the doctor has explained the procedure and its risk benefit to the patient.<br>• Check whether the informed consent, anesthesia consent is obtained.<br>• Verify that the patient had NPO for 6-8 hours before the procedures because nausea and vomiting are side effect of contrast media.<br>• Establish patients IV access before the procedure for administration of fluids, sedation and emergency medications<br>• Physical preparation should be done by removing dentures, glass and hearing aids, nails should be trimmed, remove nail polish, all accessories and ornaments should be removed, and skin preparation should be done by shaving below the umbilicus till above the knees. Betadine bath and sterile preparation should be done and put on the hospital | | | | |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | gown.<br>• Just before leaving the unit, the patient should void.<br>• Before the procedure, teach the patient how to report pain using a pain assessment scale of 0-10.<br>• Instruct the patient that they will feel a warm flush or warm sensation in their chest when the contrast medium is injected. After the injection the patient is told to breath and cough which helps to clear the contrast medium and their by reduce the flushing sensation of the contrast medium<br>• Teach breathing and coughing exercise and explain the patient and relatives regarding need for deep breathing. The patient is asked to take a deep breath and hold it without bearing down, just before the injection of dye to clear the diaphragm from the field.<br>• Explainspatient and relatives the duration of procedure and length of waiting time on the day of procedure.<br>• Explain to client the length of bed rest needed and its importance. | | | | |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | **Pre procedural assessment**<br>• A head to toe assessment should be done before the surgery<br>• Record vital signs half an hour before going to catheterization lab.<br>• Check quality of pulse and record.<br>• Monitor weight and height.<br>• The pulse should be assessed in both legs and hands, distal to insertion site so that comparison can be done after the procedure.<br><br>**Grading of pulse**<br>0 :- Absent<br>1:-Diminished<br>2:-Normal<br>3:-Moderately increased<br>4:-Markedly increased<br><br>**Allen's test**<br>This test should be performed if the client is | | | | What is allen's |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | undergoing radial approach. It is to observe the patency of ulnar artery. The hand is elevated and asks the patient to make a fist about 30 second. Pressure is applied over the ulnar and radial artery so as to occlude both and see the blanching of fingers. Ulnar pressure is released and colour should be return in seven seconds indicate patient's ulnar artery is patent.<br><br>**Diagnostic investigation**<br>• Laboratory values should be collected in advance and should be recorded which includes complete blood count, platelet count, serum creatinine, electrolytes, fasting blood sugar, prothrombin time, INR and partial thromboplastin time.<br>• Radiographic contrast media are nephrotoxic, so it is important to check the blood urea and serum creatinine levels.<br><br>Creatinine clearance=<br>Males = (140-age)×(weight)/72×creatinine | | | | test? |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | Females = (140-age)×(weight)/72×creatinine×0.85<br><br>**Pre medication**<br>• If the patient had the history of allergy, administer an oral and intravenous profile access with prednisolone 60mg orhydrocortisone 100mg along with histamines.<br>• Oral anticoagulant except aspirin should be discontinued and the client should be off heparin6 hours before coronary angiogram. Protamine sulphate is the antidote of heparin given in case of complications such as acute vessel perforation.<br>• Metformin should discontinue on the day of procedure and preferable withheld for at least 48 hours after the use of iodinated contrast media. Patients taking metformin for diabetic are at risk for severe lactic acidosis after injection of iodinated contrast media.<br>• Anti-diabeticmedications should be skipped on the day of procedure to avoid hypoglycaemia. | | | | |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | • Administer sedatives according to doctor's order and it differs from patient to patient. | | | | |
| 7 | 15 min | The group should be able to brief the post-procedural care during coronary angiogram | **V.POST PROCEDURAL CARE**<br>After the procedure the patient should be observed for 30 min and the sheath will be removed and the patient will be shifted to the ward.<br><br>**Immediate care**<br>• As soon as receiving the patient check whether all the documents are present or not.<br>• Shift the patient using proper shifting techniques.While shifting the patient from stretcher to bed don't flex or apply pressure on the affected extremity.<br>• Assess the consciousness & orientation of the patient.<br>• Connect the patient to cardiac monitor.<br>• Assess & records vital signs every<br>- every15 minutes for every 1st hour<br>- every 30minutes for next 2 hours<br>- every 1 hour for 4 hours | Powerpoint presentation | Lecture cum discussion, explaining, clarifying doubts, motivating | Listening, taking notes, asking doubts | What are the immediate care to be given for the patients after coronary angiogram? |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | • Checks the procedure site for bleeding and hematoma<br>- every 15minutes for 1st 1hour<br>- every 30minutesfor next2hour<br>- every 1hour for 4hour and records the same.<br>• Check for any numbness of the extremity.<br>• Checksfor cold and clammy extremity.<br>• Assess the intensity of pain using pain scale.<br><br>**Procedural site care**<br>• Mobilisation varies with each doctor and facility protocol. If the radial or brachial root is used the patient may ambulate immediately with an affected limb on an arm board<br>• Immobilize the extremity for 6-8 hours<br>• Patients who have femoral approach, the patient is usually out of bed at 4-6 hour and discharge after 8 hours of procedure<br>• Change the position frequently while on bed and elevate the head of the bed up to 30 degree to relieve discomfort | | | | |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | • Remind the patient not to lift the head because do so requires abdominal muscle contraction which might disturb the clot at the insertion site. To prevent hematoma formation, caution the patient not to bend or hyper extent or lie on the effected extremity. Instruct the patient how to apply pressure to the site in the event of a cough or sneeze and instruct if the site feels wet or warm. Inform the nurse immediately.<br>• Careful attention and assessment of bleeding should be done. The nurse is responsible for checking of haemostasis, distal circulation and peripheral pulses.<br>• Remind the patient to keep the effected extremity straight. Instruct the patient not to lift the head or flex the hip for 8 hours<br>• Ambulate the patient within 8 hours<br>• After the procedure hydration by IV fluid and oral intakes is essentials to ensure optimum renal clearance of the contrast agents. Careful monitoring of urine output is important. Patients are encouraged to empty the bladder because a distended bladder will | | | | |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | cause increase pain or pressure.<br>• The patient can be resumed with fluids and soft diet.<br>• Verify whether the patient void and assess for abdominal distension.<br>• Instruct the patient to inform when they feel any discomfort.<br>• In case of any complication like vasovagal reaction a reverse trendlenberg position should be given. Inj.Adrenaline is the drug of choice for vasovagal reactions.<br>• Administer an intravenous antibiotic if prescribed.<br>• Assess the intensity of pain using pain scale 0-10 and administer analgesic if needed. It is normal to feel tenderness at the site for next few days. Swelling and bruising may go with in next few weeks. The dressing at the site can be taken off after 24 hours.<br><br>**Education**<br>• Educate the patient regarding diet, activity, medicine and follow-up. | | | | |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | • Instruct the patient that they should have no bleeding from the puncture site. If they have bleeding from the site lie down flat and apply firm pressure with their figure tips using a clean cloth over the puncture site for 5 minutes. If they cannot stop bleeding immediately seek medical help.<br>• After radial artery catheterization the patient is advised not to strain or lift anything greater than 10kgs for 48-72 hours .For femoral artery catheterization for the first 5 days do not lift items more than 5kg. Avoid prolonged bending and straining. After 5 days they can return to normal activities.<br>• After 24 hours remove the wound site dressing and shower.<br>• Do not drive any vehicles or operates machine for 24 hour after angiogram. If you have stent inserted wait for 48 hour.<br>• Resume a heart healthy diet, low fat, low sodium diet. | | | | |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | • Follow-up care should be done according to doctor's order. Continue with regular medications. Do not stop taking aspirin unless prescribed. | | | | |
| 8 | 7 min | The group should be able to recognise the complications of coronary angiogram | **VI.COMPLICATIONS OF CORONARY ANGIOGRAM**<br>An increase in operator experience and development of lower profile diagnostic catheters has credited with reducing complications in the population. The current mortality rate is less than 1%. The complication can be classified into<br>i) Minor complications.<br>ii) Major complications.<br>**Minor complications**<br>• Puncture site complications:<br>a. Hematoma: - hardened area in the site with pain & discoloration.<br>b. Acute Vessel Perforation<br>• Contrast Hypersensitivity:-<br>a. Cutaneous and mucosal- utricaria pruritus, angioedema, laryngeal edema | Power point presentation | Explaining, Clarifying doubts | Listening, Asking doubts | What are the complications of coronary angiogram? |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | b. Smooth muscle- Bronchospasm causes dyspnea, cough and chocking sensation<br>c. Cardiovascular- Hypotension, Arrhythmia.<br>• Vasovagal reaction: Hypotension, nausea, yawning, vomiting, diaphoresis<br>• Pseudo aneurysm: Painful pulsatile mass, new bruit, groin pain or burning<br>• Retroperitoneal hemorrhage: Hypotension, flank pain<br>• Infection: Pain, erythema, fever, purulent, discharge<br>• Arteriovenous Fistula: Palpable thrill, audible bruit<br><br>**Major complications**<br>• Myocardial infarction<br>• Major embolization<br>• Death.<br>• Radio contrast nephropathy: It is a serious complication of coronary procedures that is due to IV infusion of iodinated contrast medium. At least 5% of the patients are estimated to have at least a 1mg/dl elevation in serum creatinine. N-acetyl cysteine an antioxidant in reduces | | | | |

| S.No. | Time | Specific Objective | Content | A.V.Aids | Teaching Activity | Learning Activity | Evaluation |
|---|---|---|---|---|---|---|---|
| | | | incidence of radio contrast nephropathy. Now the most effective method of reducing nephropathy is saline hydration 12hours before and 12hour after the procedure. Less than 30ml/hour urine output measurements indicate contrast induced renal failure in the post coronary angiogram period. | | | | |
| | 3 min | | **VII.SUMMARY ANDCONCLUSION**<br>Coronary angiogram is a gold standard in diagnosing coronary artery disease. Pre-procedural and post-procedural care is important in preventing complications in pre intra and post coronary angiogram period. Careful monitoring and evaluation of the patient is necessary during all the phase of coronary angiogram. | | | | |

**APPENDIX-F**

**LETTER SEEKING EXPERTS OPINION AND SUGGESTION FOR THE CONTENT VALIDITY**

**FROM,**

Mrs. Julin K Thomas
1st Year M.Sc. Nursing
MMM College of Nursing
Mogappair West,
Chennai - 60

**TO,**

_____
_____
_____

**Forward Through**

Principal,
MMM College of Nursing,
Mogappair West,
Chennai – 60

**Respected Sir\madam,**

**Sub:** Expert opinion for content validation of research tool.

I, Mrs.Julin K Thomas, 1st year M. Sc. Nursing student (Medical and Surgical Nursing) of MMM College of Nursing, request your good self, if you could kindly accept to validate my research tool on topic "**Effectiveness of planned educational program on knowledge and practice regarding coronary angiogram care among nurses**"at a selected hospital in Chennai.

I would be obliged if you would kindly affirm your acceptance to the undersigned with your valuable suggestion on this topic. I shall send details of my study along with the research tool.

Thanking you in anticipation.

Yours Sincerely

**Mrs.Julin K Thomas**

## LIST OF EXPERTS FOR CONTENT VALIDITY

.

1. **Dr.Latchumanadhas K, M.D.D.M**
   Senior Consultant Cardiologist,
   The Madras Medical Mission, Chennai

2. **Dr. Suma M. Victor, DNB. (Med) DNB (Card)**
   Consultant Cardiology,
   The Madras Medical Mission, Chennai
   Regd. No: 57823.

3. **Mrs.Sumathi**
   Professor & H.O.D. (Medical Surgical Nursing),
   Omayal Achi College of Nursing, Chennai

4. **Mrs.Grace Lidya**
   Assistant Professor (Medical Surgical Nursing),
   Omayal Achi College of Nursing, Chennai

5. **Prof. Mrs.Aswathi K.V.**
   Principal (Medical Surgical Nursing),
   St. Thomas College of Nursing
   Chethipuzha, Chaganacherry, Kerala

# CERTIFICATE OF VALIDATION

I hereby certify that I have validated the tool of Mrs. Julin K Thomas student, who is undertaking a study, "**Effectiveness of planned educational program on knowledge and practice regarding Coronary Angiogram Care among nurses**" at selected hospital in Chennai.

Place: Mogappair

Signature and seal of expert

Date: 25/10/14

Dr. Lakshmanadhas K. M.D.M. (Cardio)
Senior Consultant Cardiologist
THE MADRAS MEDICAL MISSION
Amrit Institute of Cardio-Vascular Sciences

Name and designation

## CERTIFICATE OF VALIDATION

I hereby certify that I have validated the tool of Mrs. **Julin K Thomas** student of MMM College of Nursing, who is undertaking a study on, "**Effectiveness of planned teaching program on knowledge and practice regarding Coronary Angiogram care among nurses**" at selected hospital in Chennai.

Place:

Signature and seal of expert

Date:

Name and designation

SUMA M VICTOR
CONSULTANT CARDIOLOGIST

Dr. SUMA M. VICTOR
DNB. (MED), DNB (CARD),
CONSULTANT CARDIOLOGY
REGD. No. 57623
MADRAS MEDICAL MISSION
CHENNAI - 600 037

# CERTIFICATE OF VALIDATION

I hereby certify that I have validated the tool of Mrs. **Julin K Thomas** student of MMM College of Nursing, who is undertaking a study on, **"Effectiveness of planned teaching program on knowledge and practice regarding Coronary Angiogram care among nurses"** at selected hospital in Chennai.

Place: PUZHAL

Signature and seal of expert

Date: 27/10/14

OMAYALACHI COLLEGE OF NURSING
No.45, Ambattur Road,
PUZHAL,
CHENNAI-600 066

Name and designation
Prof. & Head of the Department,
MEDICAL SURGICAL NURSING

# CERTIFICATE OF VALIDATION

I hereby certify that I have validated the tool of Mrs. **Julin K Thomas** student of MMM College of Nursing, who is undertaking a study on, **"Effectiveness of planned teaching program on knowledge and practice regarding Coronary Angiogram care among nurses"** at selected hospital in Chennai.

Place: 21.10.2014

Date: Chennai

21/10

Signature and seal of expert

Mrs. Grace Lydia
Asst. Professor

Name and designation

OMAYAL ACHI COLLEGE OF NURSING
No. 45, Ambattur Road,
PUZHAL, CHENNAI - 600 066.

# CERTIFICATE OF VALIDATION

I hereby certify that I have validated the tool of Mrs. Julin K Thomas student, who is undertaking a study, **"Effectiveness of planned educational program on knowledge and practice regarding Coronary Angiogram Care among nurses"** at selected hospital in Chennai.

Place: Chethipuzha

Date: 09/10/14.

Signature and seal of expert

Name and designation

Prof. Mrs. Aswathi. K.V.
Principal.

PRINCIPAL
ST. THOMAS COLLEGE OF NURSING
CHETHIPUZHA
CHANGANACHERRY - 686 104

**Appendix – G**

## CERTIFICATE OF ENGLISH EDITING

TO WHOM SO EVER IT MAY CONCERN

This is to certify that the dissertation work "A pre-experimental study to assess the effectiveness of Planned Educational Program, on the knowledge and practice regarding Coronary Angiogram Care among the staff nurses at selected hospital in Chennai" done by Mrs. Julin K Thomas, II Yr M.Sc. Nursing in MMM college of nursing, Chennai is edited for English language appropriateness by Mrs. Sasikala B. (M.A) M.A. B.Sc B.Ed.

Signature

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45, A BLOCK,
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**APPENDIX -H**

# Plagiarism Detector - Originality Report

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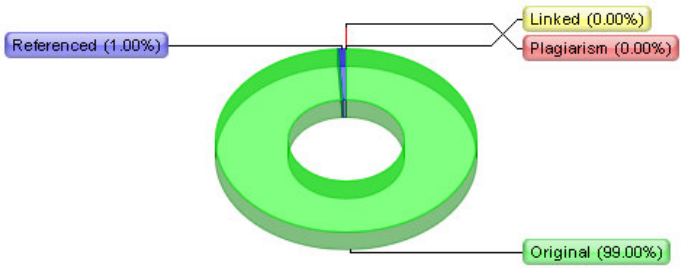


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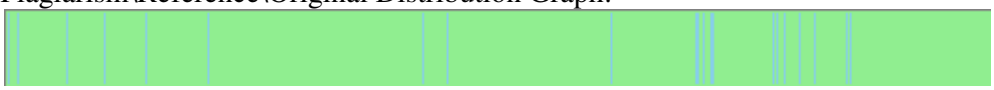

## APPENDIX – I

## PHOTOGRAPHS


Parry's